

# ADDITIONAL NOTES ON THE GENUS VITEX. XXXIV

Harold N. Moldenke

## VITEX Tourn.

Additional synonymy: *Viticipremna* J. J. Lam, Verbenac. Malay. Arch. 162. 1919.

Additional & emended bibliography: Seem., Journ. Bot. Lond. 3: 258. 1865; Seem., Fl. Vit. 189--191. 1866; Drake del Castillo, Fl. Polynés. Franç. 150--152. 1893; Hemsl., Journ. Linn. Soc. Lond. Bot. 30: 187 & 206. 1894; Burkill, Journ. Linn. Soc. Lond. Bot. 35: 50. 1901; Ebert, Beitr. Kennt. Chin. Arzneis. 84--85. 1907; E. D. Merr., Philip. Journ. Sci. Bot. 3: 432. 1908; Pulle in Lorentz, Nova Guinea, ser. 1, 8 (1): 401 (1911) and ser. 1, 8 (2): 685. 1914; Stehle, Fl. Guad. 4: 103. 1943; Yuncker, B. P. Bishop Mus. Bull. 220: 232. 1959; Lord, Trees Shrubs Austr. Gard., ed. 5, xx, 97, 232, & 321. 1978; Rzedowski, Veget. Mex. 171, 176, 186, 187, 231, & 356. 1978; Salmon, Nat. Trees N. Zeal., imp. 1, 342 & [343], fig. 1--9 (1980) and imp. 2, 342 & [343], fig. 1--9. 1981; Buck & al., Bull. Torrey Bot. Club 109: 106. 1982; Mold., Phytologia 51: 212--218. 1982.

Sirait and his associates (1962) assert that plants of this genus possess hormone-like properties.

## VITEX AGNUS-CASTUS L.

Additional & emended bibliography: Lindl., Veget. Kingd., ed. 1, 664 (1846), ed. 2, 664 (1847), and ed. 3, 664. 1853; Stehlé, Fl. Guad. 4: 103. 1943; Lord, Trees Shrubs Austr. Gard., ed. 5, 321. 1978; Mold., Phytologia 51: 213--215. 1982.

In the Dominican Republic this plant is known as "pimiento de Guinea". Lord (1978) calls it the "lilac chaste-tree", describing it as 6--10 feet tall, with lilac-colored corollas, and comments that it is "An uncommon shrub in this country [Australia], but valued abroad for its late summer flowers and aromatic fragrance which pervades the whole plant. The greyish compound leaves consist of 5--7 leaflets, the terminal one being much longer. The dense lilac flowers are in large upright sprays, and are improved by hard pruning in early spring. In Melbourne [it] blooms [from] January to March and is very lovely."

Additional citations: NORTH CAROLINA: Rockingham Co.: Leonard & Russ 2562 (M1). CULTIVATED: Bahama Islands: Fairchild 2573 (W--1556600). Dominican Republic: Ekman H.15916 (W--1555160); Liogier & Liogier 25669 (N). Guadeloupe: Stehlé 1853 (W--1713197).

## VITEX AGNUS-CASTUS f. CAERULEA (Rehd.) Mold.

Additional bibliography: Mold., Phytologia 51: 214. 1982.

Sargent reports that this plant in Puerto Rico is "said to have medicinal properties."

Additional citations: CULTIVATED: Puerto Rico: F. H. Sargent 607 (W--1781018).

*VITEX CLEMENTIS* Britton & P. Wils.

Additional bibliography: Mold., *Phytologia* 48: 453--454. 1981.

Additional citations: CUBA: Oriente: *Clemente* 6520 (W--2288934).

*VITEX COCHINCHINENSIS* Dop

Additional bibliography: Mold., *Phytologia* 51: 218. 1982.

Leaflet blades tomentose beneath, the terminal one 7--9 cm. long and 3--4 cm. wide, on a petiolule 4--5 mm. long, the lateral ones smaller, subsessile; secondaries 12--14, at first straight, later recurving; veinlet reticulation inconspicuous; panicles formed of continuous spikes, sometimes interrupted, fulvous-pubescent, the cymes many-flowered, glomerulose, tomentose, on peduncles 1--3 mm. long; bracts numerous, linear, firm, 1 cm. long, tomentose; bractlets numerous, firm, equaling the flowers; flowers subsessile, 5--6 mm. long; calyx campanulate, 3 mm. long, externally white-tomentose, the limb 5-lobed, the lobes deltoid, apically acute, equaling the tube, one smaller or absent; corolla infundibular, externally yellow-pubescent and conspicuously glandulose, internally glabrous except for the stamen insertion, the tube 2.5 mm. long, the limb 2-lipped, the upper lip 2-lobed, the lobes deltoid and apically acute, the lower lip 3-lobed, the middle lobe larger and apically rounded; stamens slightly exerted; filaments basally white-villous; style equaling the stamens; stigma 2-fid; drupes globular, 6--7 mm. in diameter, basally included by the fruiting-calyx and bractlets.

The species is based on an unnumbered Baudouin collection from somewhere in Cochinchina, on *Lefevre* 233 from Plaine des Tombeaux, *Thorel* 1114 from Saigon, and *Lecomte & Finet* 1867 & 1962 and *Pierre* 5228 from Thu Duc, Cochinchina, with no specific type designated. Dop (1928) comments that "Cette espèce se distingue nettement de tous les autres *Vitex* indochinois par ses inflorescences en épis souvent continus, de cymes, contractées, gloméruleuses. Par beaucoup de points elle se rapproche de la diagnose du *V. spicata* Loureiro (Flora Cochinchinensis, p. 390). Mais il y a entre la diagnose de Loureiro et mon espèce des différences qui ne permettent pas d'affirmer d'une façon absolue que la plante de Cochinchine est le *V. spicata* de Loureiro. En effet, la plante de Loureiro est décrite comme ayant généralement les feuilles 5-foliolées, alors que dans les nombreux échantillons de *V. cochinchinensis* que j'ai vus, je n'ai compté constamment que 3-folioles. En outre, ces folioles sont dans mon espèce ovales et entières, alors que Loureiro les décrit lanceolées et généralement crénelées. L'inflorescence correspond assez dans les deux descriptions, si l'on traduit le mot *involucelli* de Loureiro par bractées et bractéoles. Il n'y a donc aucune certitude à rapporter *V. cochinchinensis* au *V. spicata* Loureiro." Incidentally, Loureiro's binomial is now regarded as a synonym of *Vitex negundo* L.

*VITEX COFASSUS* Reinw.

Additional & emended bibliography: Fern.-Villar in Blanco, Fl. Filip., ed. 3, Nov. App. 160. 1880; Pulle in Lorentz, Nova

Guinea, ser. 1, 8 (2) 685. 1914; Heyne, Nutt. Plant. Ned. Ind., ed. 1, 4: 112--113. 1917; E. D. Merr., Enum. Philip. Flow. Pl. 3: 398. 1923; Heyne, Nutt. Plant. Ned. Ind., ed. 2, 1: 24 (1927) and ed. 2, 2: 1315--1316. 1927; Bakh., Journ. Arnold Arb. 16: 74--75. 1935; Mold., Phytologia 49: 166, 371, & 374. 1981.

The corollas are said to have been "nauve" on Millar NGF.38477.

Bakhuizen (1935) cites Kajewski 1533 & 1843 from Bougainville, Kajewski 2381 from Malaita, Kajewski 2387, 2489, & 2605 from Guadalcanal, Brass 2821 from San Cristoval, and Brass 3154 & 3272 from Ysabel island, growing from sealevel to 1200 m. altitude, and records the vernacular names, "father", "hada", "moi-kewie", "vada", "varha", "vasa", "vatha", and "wara".

Pulle (1914) cites Gjellerup 35 & 406 from West Irian, giving the overall distribution of the species as New Guinea and the Molucca Islands. He notes that Gjellerup 35 "zeigt nur sehr selten die typische Artikulation des Blattstieles".

Additional citations: MOLUCCA ISLANDS: Mangole: Herb. Neth. Ind. For. Serv. bb.29766 (Mi). NEW GUINEA: Territory of New Guinea: Millar NGF.38477 (W--2918016). BISMARK ARCHIPELAGO: New Ireland: Croft & Lelean LAE.65427 (W--2898845, W--2915343).

#### VITEX COMPRESSA Turcz.

Additional bibliography: Mold., Phytologia 48: 454--455 (1981) and 50: 246. 1982.

Recent collectors describe this species as a tree, 8--18 m. tall, the trunk to 10 cm. in diameter at breast height, the flower buds whitish, the corolla hairs white, the filaments light-violet, the anthers blackish, the pollen white, and the immature fruit green. They have found it growing in deciduous forests, at 5--250 m. altitude, in flower in April, May, June, and August, and in fruit in April and September. They record the vernacular name, "cenicero". The fruit is shiny when ripe and 12 mm. in diameter.

Bunting refers to the corollas as opening light-violet, deeper violet in the throat, 1.3 cm. long, the upper lobes pale-violet, the lower (larger) lobe more deep-violet, with a yellow spot at the base and cream-colored hairs, 7 mm. wide, the median lobe 4 mm. wide. On Aristeguieta 5315 the corollas are said to have been "blue", while on Arnoldo 2274 they were "pale-blue" and on Haught 4159 "pale-blue with a yellow spot". Arnoldo comments that his no. 2274 is "possibly another species than 2275" -- a true statement, since 2275 is *V. cymosa* Bert.

The Bunting 7652, distributed as *V. compressa*, actually is *V. stahelii* Mold.

Additional citations: SOUTHERN NETHERLANDS ANTILLES: Curaçao: Arnoldo 2274 (W--2373173). COLOMBIA: Magdalena: Haught 4159 (W--1708930). VENEZUELA: Bolívar: Aristeguieta 5315 (W--2925968); Liesner & González 5519 (Ld). Distrito Federal: Steyermark & Espinoza 106876 (N). Falcón: Bunting & Bowles 5079 (Ld). Zulia: Bunting 5106 (Ld), 6588 (Ld), 7087 (Ld), 7173 (Ld). BRAZIL: Pará: Cid, Ramos, Mota, & Rosas 2116 [Herb. Inst. Nac. Pesq. Amaz. 96355] (Ld, N).

*VITEX COMPRESSA* f. *ANGUSTIFOLIA* Mold.

Additional bibliography: Mold., *Phytologia* 48: 455 (1981) and 50: 246. 1982.

Recent collectors describe this plant as a tree, 10 m. tall, the leaflet-blades firmly membranous, dull-green above, pale dull-green beneath, and record the vernacular name, "aceiruno macho". They have encountered it at 50 m. altitude, in fruit in May.

Additional citations: VENEZUELA: Zulia: *Steyermark, Davidse, & Stoddart* 122576 (Ld).

*VITEX CYMOSA* Bert.

Additional & emended bibliography: Walp., *Repert. Bot. Syst.* 4: 86. 1845; S. Moore, *Trans. Linn. Soc. Lond. Bot.*, ser. 2, 4: 440. 1895; López-Palacios, *Fl. Venez. Verb.* 581, 582, 602--606, 627, 649, & 654, fig. 140. 1977; Mold., *Phytologia* 49: 166 & 450. 1981.

Recent collectors describe this plant as a leafy tree, 6--12 m. tall, the trunk 10--60 cm. in diameter at breast height, the flowers aromatic, and the [immature] fruit green. They have found it growing in clay soil of riverine forests, in anthesis in March and July and in fruit in September and December. The corollas are said to have been "blue" on *Cid & al.* 1384 and "rose" on *Cid & al.* 2146 & 2396.

Bunting describes the plant as a "gran árbol de copa redonda y densa; corteza oscura, fuertemente fisurada longitudinalmente y fácil de sacar pedazos; copa 12 m. o más de ancho (!); hojas jóvenes con pelos de color beige en envés y en pecíolos, hoja madura algo gruesos y quebradiza, lustrosa y verde intenso en la haz; pedúnculos morados; folíolos algo gruesos, la haz de color verde intenso  $\pm$  lustrosa con nervios y retículo impresos, punta de color crema, el envés más claro con nervios de color crema y todos elevados y sensibles al tacto; cáliz morado-pardo con pelos grises, con lóbulos extendidos como cuello, verde oscuro-violeta; corola toda violeta, em yema abierta en base del tubo, grisáceo arriba, abierta lavanda-violeta con lobo inferior de violeta un poco más intenso, con una zona amarillenta centica hacia su base con pelos blancos, 1.7--2 x 1.4 cm. de ancho, tubo 1 cm. de largo, lobo inferior 1 cm. de ancho con zona blanca amarillento y vellosa en parte unguiculada, lóbulo céntrico inferior 9 mm. de ancho; estambres y estilo de violeta claro; filamentos matizados con violeta pálida; anteras negruzcas o pardo-negruzcas, con polen blanco; estigma de villeta oscuro; fruto  $\pm$  ovoide o elipsoide, verde-crema y lustroso, matizado volviéndose rojo-pardo o morado, luego negro, globoso, 2.2 cm. de diámetro, volviéndose blando."

Additional citations: VENEZUELA: Trujillo: *Bunting & Chacón* 5049 (Ld). Zulia: *Bunting* 5112 (Ld, Ld), 5628 (Ld), 6219 (Ld); *Bunting & Alfonza G.* 7074 (Ld); *Bunting & Bowles* 5251 (Ld); *Steyermark, Davidse, & Stoddart* 123027 (Ld), 123391 (Ld). BRAZIL: Amazonas: *Rodrigues & Coêlho* 2728 (N). Pará: *Cid, Ramos, & Mota* 1384 [*Herb. Inst. Nac. Pesq. Amaz.* 94830] (Ld, N); *Cid, Ramos,*

Mota, & Rosas 1714 [Herb. Inst. Nac. Pesq. Amaz. 95851] (N, Z), 2022 [Herb. Inst. Nac. Pesq. Amaz. 96261] (Ld, N), 2146 [Herb. Inst. Nac. Pesq. Amaz. 96385] (Ld, N), 2396 [Herb. Inst. Nac. Pesq. Amaz. 96745] (Ld, N).

*VITEX DIVARICATA* Sw.

Additional bibliography: Walp., Repert. Bot. Syst. 4: 84. 1845; Urb., Symb. Antil. 7: 357--358. 1912; Mold., Phytologia 1: 103. 1939; J. T. & R. Kartesz, Syn. Checklist Vasc. Fl. 2: 468. 1980; Mold., Phytologia 48: 456 & 486 (1981) and 49: 373. 1981.

Bunting and his associates describe this species as a treelet, 4 m. tall, or tree, 12 m. tall, the trunk to 25 cm. in diameter at breast height, the leaves more or less shiny above, pale and more or less grayish beneath, "tallos de la inflorescencia matizados parduzcos", the calyx green, the corolla violet, the upper lobes lighter, the lower deeper in color, or "corola lavanda o blanca matizada con violeta muy clara, lóbulo grande violeta clara", with an agreeable odor, and the [immature] fruit green, very shiny, more or less obovoid. They have encountered the plant at 250 m. altitude, in flower in April and November, and in fruit in April.

Additional citations: VENEZUELA: Mérida: Bunting 5826 (Ld). Zulia: Bunting, Sánchez, & Alfonso G. 7401 (Ld), 7453 (Ld).

*VITEX DIVARICATA* var. *CUBENSIS* Urb.

Additional bibliography: Mold., Phytologia 44: 415. 1979; Mold., Phytol. Mem. 2: 91, 96, 366, & 589. 1980.

In regard to his var. *haitiensis* Urban (1929) says: "Magis ad var. *cubensem* Urb., quam ad typum accedit. Illa foliolis plerumque 3, non v. minus abrupte acuminatis non dematiatis diversa est."

Recent collectors describe var. *cubensis* as a small tree, 6 m. tall, or shrub, 3--4 m. tall, and have found it growing in woods and among limestone rocks, flowering in March and June. The corollas are said to have been "blue" on Alain 2905 and Ekman 11448.

The Clemente, *Chrysogone*, & Alain 3906, distributed as *V. divaricata* var. *cubensis*, actually is *V. heptaphylla* A. L. Juss.

Additional citations: CUBA: Las Villas: C. F. Baker 3409 (W--523715--cotype). Oriente: Ekman 6274 (W--2113450); Lopés F. 1323 (W--2227038). Pinar del Río: Alain 2905 (W--2288211), 4278 (W--2284599), 6046 (W--2284449); Ekman 11448 (W--2113451); M. Fernandez HAC.29153 (W--2909374).

*VITEX DIVERSIFOLIA* Kurz

Additional bibliography: Mold., Phytologia 44: 387 & 415--416. 1979; Mold., Phytol. Mem. 2: 274 & 589. 1980; Mold., Phytologia 50: 252. 1982.

*VITEX DJUMAENSIS* DeWild.

Additional bibliography: Mold., Phytologia 44: 416. 1979; Mold., Phytol. Mem. 2: 221 & 589. 1980.

*VITEX DONIANA* Sweet

Additional bibliography: Walp., Repert. Bot. Syst. 4: 88. 1845; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 172. 1895; White & Angus, Forest Fl. N. Rhodes. 371. 1962; Mold., Phytologia 48: 456--457. 1981.

The *Phillips* 2924, distributed as typical *V. doniana*, actually is its var. *parvifolia* (Engl.) Mold.

Additional citations: NIGERIA: *Bernardi* 8727 (W--2896837).

*VITEX DONIANA* var. *PARVIFOLIA* (Engl.) Mold.

Additional bibliography: Mold., Phytologia 44: 479--480 (1979) and 46: 30. 1980; Mold., Phytol. Mem. 2: 202, 213, 215, 221, 223, 224, 228, 236, 241, 366, & 590. 1980.

Phillips describes this plant as a tree, 50 feet tall, the crown 30 feet wide, the corollas "white and deep-purple", and encountered it in lakeshore sand, at 1500 feet altitude, in flower in October.

Additional citations: MALAWI: *Phillips* 2924 (Ba--377862).

*VITEX DRYADUM* S. Moore

Additional bibliography: Mold., Phytologia 44: 480. 1979; Mold., Phytol. Mem. 2: 241 & 590. 1980.

*VITEX DUBOISII* Mold.

Additional bibliography: Mold., Phytologia 44: 480. 1979; Mold., Phytol. Mem. 2: 221 & 590. 1980.

*VITEX DUCKEI* Huber

Additional bibliography: Mold., Phytologia 45: 483 & 495. 1980; Mold., Phytol. Mem. 2: 171, 457, & 590. 1980.

Recent collectors refer to this species as a tree, 6 m. tall, and have found it in anthesis in September. The corollas are said to have been "rose" colored on *Cid & al.* 2488.

Additional citations: BRAZIL: Amazonas: *Rodrigues & Lima* 3451 (N). Pará: *Cid, Ramos, Mota, & Rosas* 2466 [Herb. Inst. Nac. Pesq. Amaz. 96915] (Ld), 2488 (N).

*VITEX DUCLOUXII* Dop

Additional & emended bibliography: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 208 & 211. 1928; Mold., Phytologia 44: 481. 1979; Mold., Phytol. Mem. 2: 280 & 590. 1980.

*VITEX EBERHARDTII* Dop

Synonymy: *Vitex eberhardtii* Dop, Bull. Soc. Hist. Nat. Toulouse 57: 210, sphalm. 1928.

Additional & emended bibliography: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 204, 210, & 211. 1928; Mold., Phytologia 44: 481. 1979; Mold., Phytol. Mem. 2: 290, 294, & 590. 1980; Mold., Phytologia 50: 266. 1982.

Dop (1928) comments that this "Espèce facile à reconnaître à ses inflorescences et son calice glabre et à ses fleurs dont la corolle

est plus grande que celle des autres *Vitex* de ce groupe."

*VITEX ELAKELAKENSIS* Mold.

Additional bibliography: Mold., *Phytologia* 44: 481. 1979; Mold., *Phytol. Mem.* 2: 251 & 590. 1980.

*VITEX ELMERI* Mold.

Additional bibliography: Mold., *Phytologia* 44: 481. 1979; Mold., *Phytol. Mem.* 2: 309, 458, & 590. 1980.

*VITEX EPIDICTYODES* Mildbr.

Additional bibliography: Mold., *Phytologia* 44: 481 (1979) and 46: 31. 1980; Mold., *Phytol. Mem.* 2: 221, 223, 228, 239, & 590. 1980.

*VITEX ERIOCLONA* H. J. Lam

Additional bibliography: Heyne, *Nutt. Plant. Ned. Ind.*, ed. 2, 1: 24 (1927) and ed. 2, 2: 1316. 1927; Mold., *Phytologia* 44: 481--482. 1979; Mold., *Phytol. Mem.* 2: 319 & 590. 1980.

*VITEX EXCELSA* Mold.

Additional bibliography: Mold., *Phytologia* 48: 457. 1981.

Additional citations: BRAZIL: Para: *Vilhena, Lobo, & Ribeiro* 176 (N).

*VITEX EXCELSA* var. *PETIOLATA* Mold.

Additional bibliography: Mold., *Phytologia* 44: 482. 1979; Mold., *Phytol. Mem.* 2: 136 & 590. 1980.

*VITEX FARAFANGANENSIS* Mold.

Additional bibliography: Mold., *Phytologia* 44: 482. 1979; Mold., *Phytol. Mem.* 2: 251 & 590. 1980.

*VITEX FERRUGINEA* Schum. & Thonn.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 86 & 90. 1845; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Mold., *Phytologia* 44: 482--483. 1979; Mold., *Phytol. Mem.* 2: 206, 209--211, 213, 221, 224, 228, 234, 456, & 590. 1980.

*VITEX FISCHERI* Gürke

Additional bibliography: Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; White & Angus, *Forest Fl. N. Rhodes.* 371. 1962; Mold., *Phytologia* 44: 483--484 (1979) and 45: 494. 1980; Mold., *Phytol. Mem.* 2: 224, 228, 231, & 590. 1980.

*VITEX FLAVA* Ridl.

Additional bibliography: Mold., *Phytologia* 44: 484. 1979; Mold., *Phytol. Mem.* 2: 219 & 590. 1980.

*VITEX FLAVENS* H.B.K.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 86. 1845; Bocq. in Baill., *Rec. Obs. Bot.* 3: 253. 1863; Mold., *Phytologia*

48: 457 (1981) and 49: 368. 1981.

The *Vilhena*, *Lobo*, & *Ribeiro* 176, distributed as *V. flavens*, actually is *V. excelsa* Mold.

*VITEX FLORIBUNDA* Legris

Additional bibliography: Mold., *Phytologia* 44: 485. 1979; Mold., *Phytol. Mem.* 2: 266 & 590. 1980.

*VITEX FLORIDULA* Duchass. & Walp.

Additional bibliography: Mold., *Phytologia* 45: 483. 1980; Mold., *Phytol. Mem.* 2: 84, 458, & 590. 1980; Mold., *Phytologia* 49: 373. 1981.

*VITEX FROESII* Mold.

Additional bibliography: Mold., *Phytologia* 44: 486. 1979; Mold., *Phytol. Mem.* 2: 171 & 590. 1980.

*VITEX GABUNENSIS* Gürke

Additional bibliography: Mold., *Phytologia* 44: 486. 1979; Mold., *Phytol. Mem.* 2: 216 & 590. 1980.

*VITEX GAMOSEPALA* W. Griff.

Additional & emended bibliography: W. Griff., *Notul. Pl. Asiat.* 4: 178--179, pl. 448, fig. 2. 1854; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Ridl., *Journ. Roy. Asiat. Soc. Straits* 57: 84. 1910; Corner, *Wayside Trees*, ed. 2, 707 & 708. 1952; Mold., *Phytologia* 48: 457. 1981.

Ridley (1910) says that this species grows in both woods and open country. Corber (1952) calls it the "Glabrous Yellow Vitex", lists the vernacular names, "leban pachat" and "leban pelamdok", and describes it as "A shrub or small tree to 40 ft. high: twigs, leaves and inflorescences glabrous or nearly so: twigs and leaf-stalks light fawn brown: young leaves reddish pink. Leaves with 3 stalked leaflets: middle leaflet 3--8 x 1 1/2 -- 3 1/2", elliptic, rather long-tipped, with 4--7 pairs of side-veins: leaf-stalk 1--4" long. Flowers 1/2" long, 1/4" wide, clear yellow, in small stalked clusters up to 2" long, in the leaf-axils: calyx with 3 small teeth. Fruit 1/4" wide, round, black." He gives its distribution as "Malay Peninsula, Sumatra, Borneo: common in open country and in the forest, especially by streams and on hillsides up to an altitude of 4,000 ft."

*VITEX GAMOSEPALA* var. *KUNSTLERI* King & Gamble

Additional bibliography: Mold., *Phytologia* 44: 487 & 488. 1979; Mold., *Phytol. Mem.* 2: 297, 319, & 590. 1980.

*VITEX GAMOSEPALA* var. *SCORTECHINII* King & Gamble

Additional bibliography: Mold., *Phytologia* 44: 488. 1979; Mold., *Phytol. Mem.* 2: 297, 319, & 590. 1980.

*VITEX GARDNERIANA* Schau.

Additional bibliography: Mold., *Phytologia* 45: 483. 1980; Mold.,

Phytol. Mem. 2: 171 & 590. 1980.

*VITEX GAUMERI* Greenm.

Additional bibliography: Rzedowski, Veget. Mex. 171 & 187, fig. 203. 1978; Mold., Phytologia 48: 457--458 (1981), 49: 451 (1981), and 50: 243. 1982.

Additional illustrations: Rzedowski, Veget. Mex. 187, fig. 203 (in color). 1978.

Barrera encountered this plant in "selva mediana subperenifolia", at 20 m. altitude, in Mexico. Other collectors refer to it as a tree, 5--12 m. tall, the trunk 12 inches in diameter at breast height, and have found it in open forests on semi-arid highlands, xerophytic areas, quebradas, and matorrales, at 300--1100 m. altitude, in flower in May and June. The corollas are described as having been "blue" on *Molina R. 7031*, "deep-blue and pleasantly fragrant" on *Yuncker & al. 8165*, and "purple" on *Molina R. 6584 & 6990*.

Additional citations: MEXICO: Quintana Roo: *Barrera 886* (Me--297054). Yucatán: *Lundell & Lundell 7321* (W--1975066). GUATEMALA: El Petén: *Ortiz 1259* (W--2925249). BELIZE: Herb. Conserv. Forests Belize 4 [Project 46] (W--1977771). HONDURAS: Choluteca: *Williams & Molina R. 10918* (W--2085555). Comayagua: *Molina R. 6990* (W--2400820), *7031* (W--2400845); *Williams & Molina R. 12330* (W--2021784), *18156* (W--2085626). Copán: *Molina R. 6584* (W--2400844). Yoro: *Molina R. 6819* (W--2400846); *Yuncker, Koepper, & Wagner 8165* (W--1747643).

*VITEX GIGANTEA* H.B.K.

Additional bibliography: Walp., Repert. Bot. Syst. 4: 85--86. 1845; Bocq. in Baill., Rec. Obs. Bot. 3: 253. 1863; Mold., Phytologia 48: 458. 1981.

*VITEX GIORGII* DeWild.

Additional bibliography: Mold., Phytologia 44: 493. 1979; Mold., Phytol. Mem. 2: 221 & 590. 1980.

*VITEX GLABRATA* R. Br.

Additional & emended bibliography: F. Muell., Fragm. 6: 153. 1868; Ceron, Cat. Pl. Herb. Manila 133. 1892; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 172. 1895; F. M. Bailey, Queensl. Fl. 4: 1179 & 1180. 1901; Koord., Exkursionsfl. 3: 137 & 495. 1912; E. D. Merr., Philip. Journ. Sci. Bot. 7: 343--344. 1912; Heyne, Nutt. Plant. Ned. Ind., ed. 2, 1: 24 (1927) and ed. 2, 2: 1316. 1927; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 204 & 207--211. 1928; Kanjilal, Das, Kanjilal, & De, Fl. Assam 3: 479, 480, 485, & 561. 1939; Chippendale, Proc. Linn. Soc. N. S. Wales 96: 256. 1971; J. T. & R. Kartesz, Syn. Checklist Vasc. Fl. 2: 468. 1980; Mold., Phytologia 49: 166, 457, & 459 (1981), 50: 252 (1982), and 51: 218. 1982.

Merrill (1923) cites the following collections from Balabac, Culion, Luzon, Mindanao, Negros, Mindor, and Palawan in the Philip-

pinos: Klemme 19546, Merrill 2162 & 9330, Miranda 20638 & 20771, Ramos 39371, Ramos & Pascasio 34472, Razon 23671, Somonte 24817, Whitford & Hutchinson 9490, and Williams 2949, all deposited in the Manila herbarium (now destroyed). He asserts that in the Philippines it inhabits forests at low altitudes and he gives its overall distribution, as known to him, as India to Indochina, Java, Timor, Celebes, New Guinea, and tropical Australia. When he published his *V. nitida* in 1912, based on Klemme 19546, "growing near the mountains" at Tangob, Misamis Province, Mindanao, known locally as "sasalit" or "tugaspan", he commented that it was "A species well characterized by its 3- and 5-foliolate leaves, the lower two leaflets, when present, much reduced, its axillary, peduncled cymes, truncate calyx, and densely pubescent corolla. It is most closely allied to *Vitex pentaphylla* Merr., but is apparently sufficiently distinct from that species." In 1923 he reduced both *V. nitida* and *V. pentaphylla* to synonymy under *V. glabrata*, where I am retaining them.

Heyne (1917) states that this is a "Boom, tot 25 M. hoog en 1.25 M. dik, aan de zuidkust met zuilvormigen stam en hoog aangezette kroon, op het Wilisgebergte daarentegen met korten, laag vertakten stam. Hij is verbreid over den geheelen Maleischen Archipel en groeit op Java verstrooid beneden 900 M. zeehoogte, doch is op sommige plaatsen niet zeldzaam. Het hout wordt soms voor huisbouw gebruikt: oude boomen zouden bij Tjilatjap zeer vaak hol zijn." Dop (1928) lists the vernacular names, "cay ma", "popoul tuh", and "xo con", and comments that "D'après Poilane, ce bois serait un bois jaune très dur." He cites Gaudichaud 287 and Poilane 7841 from Annam, Chatillon s.n., Godefroy 242, and Pierre 1213 from Cambodia, Corroy s.n., Gaudichaud s.n., and Poilane 40349 & 40781 from Cochinchina, and Harmand 323 and Thorel s.n. from Laos.

*VITEX GLABRATA* f. *BOMBACIFOLIA* (Wall.) Mold.

Additional bibliography: Walp., Repert. Bot. Syst. 4: 86--87 & 91. 1845; Mold., Phytol. Mem. 2: 266, 271, 274, 289, 366, 457, 460, & 590. 1980; Mold., Phytologia 45: 483--484 (1980) and 51: 218. 1982.

Material of this form has been misidentified and distributed in some herbaria as *V. canescens* Kurz.

Additional citations: BANGLADESH: Majumder & Islam 87 (Mi, Mi).

*VITEX GLABRATA* f. *PALLIDA* (Wall.) Mold.

Additional bibliography: Walp., Repert. Bot. Syst. 4: 91. 1845; Buek, Gen. Spec. Syn. Candoll. 3: 502. 1858; Mold., Phytologia 45: 484. 1980; Mold., Phytol. Mem. 2: 274, 459, & 590. 1980.

*VITEX GLABRATA* var. *POILANEI* Mold.

Additional bibliography: Mold., Phytologia 45: 484; Mold., Phytol. Mem. 2: 289, 294, & 590. 1980.

*VITEX GODERDZICA* Tsagareli

Additional bibliography: Mold., Phytologia 45: 484--485. 1980;

Mold., Phytol. Mem. 2: 369 & 590. 1980.

*VITEX GOLUNGENSIS* J. G. Baker

Additional bibliography: Mold., Phytologia 45: 485. 1980; Mold., Phytol. Mem. 2: 234 & 590. 1980.

*VITEX HARVEYANA* H. H. W. Pearson

Additional bibliography: Mold., Phytol. Mem. 2: 238, 241, 244, 246, & 590. 1980; Mold., Phytologia 45: 488--489 (1980), 48: 463 (1981), 49: 449 (1981), and 50: 251, 266, & 269. 1982.

*VITEX HARVEYANA* f. *GEMINATA* (H. H. W. Pearson) Mold.

Additional bibliography: Mold., Phytologia 45: 489 (1980) and 50: 251, 266, & 269. 1982.

*VITEX HAUSKNECHTII* Borm.

Additional bibliography: Mold., Phytologia 45: 489--490. 1980; Mold., Phytol. Mem. 2: 255, 456, & 590. 1980.

*VITEX HEMSLEYI* Briq.

Additional bibliography: Mold., Phytologia 48: 459 (1981) and 49: 451. 1981.

Recent collectors describe this species as a tree, 8--10 m. tall, and have found it growing at sealevel, in anthesis in June and July. The corollas are said to have been "violet" on Neill 4581 and "blue" on Forment 887. The latter collector records the vernacular name, "azulillo".

Material of this species has been misidentified and distributed in some herbaria as *V. mollis* H.B.K.

Additional citations: MEXICO: Guerrero: Forment 887 (Me--293117). NICARAGUA: Zelaya: Neill 4581 (Ld).

*VITEX HENRYI* Mold.

Additional bibliography: Mold., Phytologia 45: 491. 1980; Mold., Phytol. Mem. 2: 280 & 590. 1980.

*VITEX HEPTAPHYLLA* A. L. Juss.

Additional synonymy: *Vitex heptophylla* A. L. Juss. ex Mold., Fifth Summ. 2: 718, in syn. 1971.

Additional bibliography: Walp., Repert. Bot. Syst. 4: 84 & 90--91. 1845; Mold., Phytologia 45: 491. 1980; Mold., Phytol. Mem. 2: 91, 96, & 590. 1980.

Recent collectors describe this species as a tree, 5--6 m. tall, the leaves 5--7-foliolate, and the fruit yellow or orange. They have found it growing in woods, thickets, and open pinelands, on wooded hillsides, and "common" on riverbanks, at 300--1000 m. altitude, in both flower and fruit in May and December. The corollas are said to have been "violet" in color on Jiménez 3690, "deep-violet" on Valeur 630, and "deep-purple" on Holdridge 1839. Valeur records the vernacular name, "mata becerro", while León & Alain (1974) call it "penda".

Material of this species has been misidentified and distributed

in some herbaria as *V. divaricata* var. *cubensis* Urb. and *V. umbrosa* Sw.

Additional citations: CUBA: Oriente: Alain, Acuña, & López Figueiras 5830 (W--2284402); Alain & Clemente 1046 (W--2288050); Clemente 5004 (W--2284410); Clemente, Chrysogone, & Alain 3906 (W--1883106); León 11801 (W--2289309). HISPANIOLA: Dominican Republic: Ekman H.12643 (W--1711562); J. Jimenez 3690 (W--2229700, W--2229701); Valeur 630 (W--1478796), 936 (W--1557071), 972 (W--1557102). Haiti: Holdridge 1839 (W--1880782).

*VITEX HIRSUTISSIMA* J. G. Baker

Additional bibliography: Mold., Phytologia 45: 491. 1980; Mold., Phytol. Mem. 2: 252 & 590. 1980.

*VITEX HOCKII* DeWild.

Additional bibliography: Mold., Phytologia 45: 492 (1980) and 46: 31. 1980; Mold., Phytol. Mem. 2: 221, 228, 234, & 590. 1980.

*VITEX HOLOADENON* Dop

Additional & emended bibliography: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 204--205, 210, & 211. 1928; A. W. Hill, Ind. Kew. Suppl. 9: 297. 1938; Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 289, 458, & 590. 1980.

Dop (1928) comments that "Cette espèce est remarquable par ses feuilles 1-foliolées, son revêtement glandulaire dense aussi bien sur les fleurs que sur l'appareil végétatif et sa drupe obconique. Le grand développement de l'appareil glandulaire la rapproche des *V. luteoglandulosa* Lam. et *V. glandulosa* Lam. Elle s'en distingue particulièrement par ses feuilles 1-foliolées et sa drupe obconique." Other species of this genus with 1-foliolate leaves are *V. gardneriana* Schau. of Brazil, *V. cofassus* Reinw. of Indonesia, and various species of Madagascar.

*VITEX HOLOCALYX* J. G. Baker

Additional bibliography: Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 234 & 591. 1980.

*VITEX HORNEI* Hemsl.

Additional bibliography: Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 248 & 591. 1980.

*VITEX HUMBERTI* Mold.

Additional bibliography: Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 252 & 591. 1980.

*VITEX HUMBERTI* var. *ANGUSTATA* Mold.

Additional bibliography: Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 252 & 591. 1980.

*VITEX HYPOLEUCA* Schau.

Additional bibliography: Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 171 & 591. 1980.

Recent collectors refer to this species as a tree or treelet, 4 m. tall, the leaves bicolored, whitish beneath, and the fruit at first green, later dark, finally almost black, and have found it in fruit in May.

Additional citations: BRAZIL: Bahia: Carvalho, Mori, Boom, & Silva Guedes 723 (Ld, Ld, N).

*VITEX IBARENSIS* J. G. Baker

Additional bibliography: Mold., Phytologia 45: 492. 1980; Mold., Phytol. Mem. 2: 252 & 591. 1980.

*VITEX IMPRESSINERVIA* Mildbr.

Additional bibliography: Mold., Phytologia 45: 493. 1980; Mold., Phytol. Mem. 2: 215 & 591. 1980.

*VITEX INTEGRIFOLIA* Urb.

Additional bibliography: Mold., Phytologia 45: 493. 1980; Mold., Phytol. Mem. 2: 96 & 591. 1980.

Additional citations: HISPANIOLA: Dominican Republic: Ekman H. 14882 (W--1479915).

*VITEX ISOTJENSIS* Gibbe

Additional bibliography: Mold., Phytologia 45: 493. 1980; Mold., Phytol. Mem. 2: 236, 458, & 591. 1980; Mold., Phytologia 49: 378. 1981.

*VITEX KLUGII* Mold.

Additional bibliography: Mold., Phytologia 48: 459. 1981.

Recent collectors have encountered this species in seasonally inundated tahuampa, at 120 m. altitude.

Additional citations: PERU: Loreto: Gentry, Vasquez, Jaramillo, & Stern 29191 (Ld).

*VITEX KUYLENII* Standl.

Additional bibliography: Mold., Phytologia 48: 459--460. 1981.

Material of this species has been misidentified and distributed in some herbaria as *V. mollis* H.B.K.

Additional citations: MEXICO: Guerrero: Forment 768 (Me--293089).

*VITEX KWANGSIENSIS* P'ei

Additional bibliography: Mold., Phytologia 46: 11. 1980; Mold., Phytol. Mem. 2: 280 & 591. 1980.

*VITEX LAMIANA* Pieper

Additional bibliography: Mold., Phytologia 46: 11. 1980; Mold., Phytol. Mem. 2: 228, 231, & 591. 1980.

*VITEX LANIGERA* Schau.

Additional bibliography: Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 172. 1895; Mold., Phytologia 48: 460. 1981.

*VITEX LASIANTHA* H. Hallier

Additional bibliography: Mold., *Phytologia* 46: 12. 1980; Mold., *Phytol. Mem.* 2: 252, 458, & 591. 1980.

*VITEX LASTELLEI* Mold.

Additional bibliography: Mold., *Phytologia* 46: 12. 1980; Mold., *Phytol. Mem.* 2: 328 & 591. 1980.

*VITEX LEUCOXYLON* L. f.

Additional synonymy: *Vitex triflora odorata, sylvestris* J. Burm., *Thes. Zeyl.* 209--210, pl. 109. 1737.

Additional bibliography: J. Burm., *Thes. Zeyl.* 209--210, pl. 109. 1737; Walp., *Repert. Bot. Syst.* 4: 82 & 91. 1845; Bocq. in Baill., *Rec. Obs. Bot.* 3: 253. 1863; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Mold., *Phytologia* 49: 166, 381, & 452. 1981; Sharma, Shetty, Vivekan., & Rathakr., *Journ. Bomb. Nat. Hist. Soc.* 75: 33. 1981.

Additional illustrations: J. Burm., *Thes. Zeyl.* pl. 109. 1737.

Sharma and his associates (1981) cite *Rathakrishnan 37983* and *Vivekananthan 40742* from Tamil Nadu, India, and describe the species as a "Tree with white fls., common" there.

Burman's *V. triflora odorata, sylvestris*, previously regarded by me as applying to *V. trifolia* L., appears to me now actually to be synonymous with *L. leucoxydon* instead.

Additional citations: MOUNTED ILLUSTRATIONS: Burm., *Thes. Zeyl.* pl. 109. 1737 (Ba).

*VITEX LEUCOXYLON* f. *SALIGNA* (Roxb.) Mold.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 91. 1845; Mold., *Phytologia* 49: 166. 1981.

*VITEX LEUCOXYLON* f. *ZEYLANICA* (Mold.) Mold.

Additional bibliography: Mold., *Phytologia* 48: 460. 1981.

Additional citations: SRI LANKA: *Fosberg & Jayasinghe 57012* (N).

*VITEX LIMONIFOLIA* Wall.

Emended synonymy: *Vitex limoniifolia* Wall. ex Fletcher, *Kew Bull. Misc. Inf.* 1938: 431 & 433. 1938.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 84. 1845; Collett & Hemsl., *Journ. Linn. Soc. Lond. Bot.* 28: 110. 1890; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Dop, *Bull. Soc. Hist. Nat. Toulouse* 57: 198, 199, 210, & 211. 1928; Mold., *Phytologia* 48: 460--461 (1981) and 49: 445. 1981.

Craib (1911) cites *Kerr 2011* and *Vanpruk 184* from Thailand. Dop (1928) cites *Chatillon s.n.*, *Harmand s.n.*, *Pierre 5216*, and *Thorel 2007* from Cambodia and *Pierre 5612* from Thailand. Collett & Hemsley (1890) record the species from Meiktila and note that it was "also collected by Mr. Aplin at Koloubouk camp", listing it likewise from "Ava and Tenasserim to Siam".

*VITEX LOBATA* Mold.

Additional bibliography: Mold., *Phytologia* 46: 21. 1980; Mold.,

Phytol. Mem. 2: 252 & 591. 1980.

*VITEX LOKUNDJENSIS* Pieper

Additional bibliography: Mold., Phytologia 46: 12 & 21. 1980; Mold., Phytol. Mem. 2: 215, 221, 228, 238, & 591. 1980.

*VITEX LUKUNDJENSIS* var. *KRUCKEI* Pieper

Additional bibliography: Mold., Phytologia 46: 21. 1980; Mold., Phytol. Mem. 2: 215, 221, & 591. 1980.

*VITEX LONGIPETIOLATA* Gürke

Additional bibliography: Mold., Phytologia 46: 21--22. 1980; Mold., Phytol. Mem. 2: 215, 221, 234, & 591. 1980.

*VITEX LONGISEPALA* King & Gamble

Additional bibliography: Corner, Wayside Trees, ed. 2, 707 & 708. 1952; Mold., Phytologia 48: 461. 1981.

Corner (1952) calls this species the "Perak Yellow Vitex" and describes it as "A tree with the young leaves fawn-colour, like *V. vestita* but:-- Leaflets often broader, up to 4 1/2" wide: leaf-stalk up to 5" long. Flowers 2/3" long, 1/3" wide, considerably wider than in *V. gamosepala*: flower-clusters up to 3 1/2" long, few-flowered: calyx with 5 long, pale green sepals 1/4 -- 1/3" long: corolla with rich yellow throat. Fruit surrounded by the long sepals. Malaya: Penang to Malacca, common in Perak with *V. gamosepala*."

*VITEX LONGISEPALA* var. *LONGIPES* Mold.

Additional bibliography: Mold., Phytologia 46: 22. 1980; Mold., Phytol. Mem. 2: 298 & 591. 1980.

*VITEX LUCENS* T. Kirk

Additional & emended bibliography: D. Dietr., Syn. Pl. 3: 611. 1843; Walp., Repert. Bot. Syst. 4: 84 & 87. 1845; Seem., Journ. Bot. Lond. 3: 258. 1865; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 172. 1895; E. D. Merr., Bull. Philip. Forest. Bur. 1: 51. 1903; Heyne, Nutt. Plant. Ned. Ind., ed. 1, 4: 113--114. 1917; Lord, Trees Shrubs Austr. Gard., ed. 5, 97 & 321. 1978; Salmon, Nat. Trees N. Zeal., imp. 1, 342 & [343], fig. 1--9 (1980) and imp. 2, 342 & [343], fig. 1--9. 1981; Mold., Phytologia 49: 167, 371, 374, & 381. 1981.

Additional illustrations: Salmon, Nat. Trees N. Zeal., imp. 1, 342 & [343], fig. 1--9 (1980) and imp. 2, 342 & [343], fig. 1--9. 1981.

Orchard found this tree in fruit in October. Lord (1978) describes it as growing to 30 feet tall, "a handsome tree with glossy deep green leaves, the 3 to 5 rounded leaflets wavy-edged, and sprays of bright red 2-lipped flowers resembling Mint-bush but larger, over most of the year. Has been called New Zealand Oak, its figured and durable timber being a highly valued hardwood in the Dominion."

Additional citations: NEW ZEALAND: North: MacDaniels P. 563 (It); Orchard 3540 (Ba--370074). MOUNTED ILLUSTRATIONS: Hook., Icon. Pl. "pl. 1519/1520" (Ba--380420).

*VITEX LUNDENSIS* Gürke

Additional bibliography: Mold., Phytologia 46: 28. 1980; Mold., Phytol. Mem. 2: 221 & 591. 1980.

*VITEX LUTEA* Exell

Additional bibliography: Mold., Phytologia 46: 28. 1980; Mold., Phytol. Mem. 2: 234 & 591. 1980.

*VITEX LUTEOGLANDULOSA* H. J. Lam

Additional bibliography: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928; Mold., Phytologia 46: 28. 1980; Mold., Phytol. Mem. 2: 328 & 591. 1980.

Dop (1928) asserts that the "appareil glandulaire" of this species and of *V. holoadenon* Dop and *V. glandulosa* H. J. Lam [now regarded as a synonym of *V. parviflora* A. L. Juss.] is very similar.

*VITEX LUZONICA* H. J. Lam

Additional bibliography: E. D. Merr., Enum. Philip. Flow. Pl. 3: 394. 1923; Mold., Phytologia 46: 28. 1980; Mold., Phytol. Mem. 2: 309 & 591. 1980.

Merrill (1923) cites only *Ahern* 706 "(not 760)" and comments that "This number seems to be missing in the herbarium of the [Philippine] Bureau of Science. The species is apparently related to *Vitex glabrata* R. Br. Endemic."

*VITEX MACROFOLIOLATA* Mold.

Additional bibliography: Mold., Phytologia 46: 28. 1980; Mold., Phytol. Mem. 2: 328 & 591. 1980.

*VITEX MADAGASCARIENSIS* Mold.

Additional bibliography: Mold., Phytologia 46: 28. 1980; Mold., Phytol. Mem. 2: 252 & 591. 1980.

*VITEX MADIENSIS* Oliv.

Additional bibliography: White & Angus, Forest Fl. N. Rhodes. 372 & 455. 1962; Mold., Phytologia 46: 28--31. 1980; Mold., Phytol. Mem. 2: 201, 202, 207, 209, 215--217, 221, 223, 224, 228, 234, 236, 239, 241, & 591. 1980; Mold., Phytologia 50: 267. 1982.

The *E. Phillips* 2880, distributed as typical *V. madiensis*, actually represents its var. *gossweileri* Pieper.

*VITEX MADIENSIS* var. *ANGUSTIFOLIA* Pieper

Additional bibliography: Mold., Phytologia 46: 30. 1980; Mold., Phytol. Mem. 2: 202 & 591. 1980.

*VITEX MADIENSIS* var. *AROMATICA* Pieper

Additional bibliography: Mold., Phytologia 46: 30. 1980; Mold.,

Phytol. Mem. 2: 209, 224, & 591. 1980.

*VITEX MADIENSIS* var. *GOSSWEILERI* Pieper

Additional bibliography: Mold., *Phytologia* 46: 30. 1980; Mold., *Phytol. Mem.* 2: 231, 234, 236, 239, & 591. 1980.

Phillips refers to this plant as a tree, 4 feet tall, and found it growing in grassland at 5500 feet altitude. He erroneously distributed it as typical *V. madiensis* Oliv.

Additional citations: MALAWI: E. Phillips 2880 (Ba--377611).

*VITEX MADIENSIS* var. *MILANJIENSIS* (Britten) Pieper

Additional bibliography: Mold., *Phytologia* 48: 461 (1981) and 50: 267. 1982.

*VITEX MADIENSIS* var. *SCHWEINFURTHII* (Gürke) Pieper

Additional & emended bibliography: Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; J. G. Baker in Thiselet.-Dyer, *Fl. Trop. Afr.* 5: 316 & 322. 1900; Mold., *Phytologia* 46: 29 & 31. 1980; Mold., *Phytol. Mem.* 2: 202, 215, 221, & 591. 1980.

*VITEX MASONIANA* Pittier

Additional bibliography: Mold., *Phytologia* 46: 32. 1980; Mold., *Phytol. Mem.* 2: 84, 112, & 592. 1980.

Recent collectors refer to this species as a tree, 75 feet tall, with gray-green [immature] fruit in July, and have found it growing in woods.

Additional citations: PANAMA: Darién: Tyson, Dwyer, Blum, & Duke 4847 (N).

*VITEX MEDUSAECALYX* H. J. Lam

Additional bibliography: Mold., *Phytologia* 46: 32. 1980; Mold., *Phytol. Mem.* 2: 319 & 592. 1980.

*VITEX MEGAPOTAMICA* (Spreng.) Mold.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 88. 1845; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Klein, *Sellowia* 32: 172. 1980; Mold., *Phytologia* 48: 462. 1981.

Duarte describes this species as a tree, 6--8 m. tall, "planta que vai desde arbusto prostrado na areia fixando dunas até árvore".

Rimpler & Schulz (1967) have isolated an insect-moulting hormone, 20-hydroxyecdysone, from this species.

Material of this taxon has been misidentified and distributed in some herbaria as *V. schaueriana* Mold.

Additional citations: BRAZIL: Paraná: Carvalho 101 (Ba). Santa Catarina Island: Duarte 3060 [Herb. Jard. Bot. Rio Jan. 73512] (Mi, W--2949720). ARGENTINA: Misiones: Renvoize 3204 (N), (N).

*VITEX MEGAPOTAMICA* f. *ALBIFLORA* Mold.

Additional bibliography: Mold., *Phytologia* 46: 35 & 36. 1980;

Mold., Phytol. Mem. 2: 171, 366, & 592. 1980.

*VITEX MEGAPOTAMICA* var. *MULTINERVIS* (Cham.) Mold.

Additional bibliography: Walp., Repert. Bot. Syst. 4: 88. 1845; Mold., Phytologia 46: 31 & 35--38. 1980; Mold., Phytol. Mem. 2: 171, 180, 193, 366, 435, 459, 460, & 592. 1980.

Recent collectors refer to this plant as a tree, 8 m. tall, with wine-colored mature fruit (in March), and have found it growing in gallery forests. Kummrow refers to the fruit as black.

Additional citations: BRAZIL: Paraná: *Hatschbach* 39782 (Ba--375469); *Kummrow* 419 (Ba).

*VITEX MENABEENSIS* Capuron

Additional bibliography: Mold., Phytologia 46: 38. 1980; Mold., Phytol. Mem. 2: 252. 1980; Mold., Phytologia 50: 269. 1982.

*VITEX MEXIAE* Mold.

Additional bibliography: Mold., Phytologia 46: 38--39. 1980; Mold., Phytol. Mem. 2: 171, 366, 460, & 592. 1980.

Mimuri describes this plant as a shrub, 1.7 m. tall, the fruit spheroid-prolate, 1.1--1.7 cm. long and 0.9--1.6 cm. wide, "preto brilhante glaucescente", in January.

Additional citations: BRAZIL: São Paulo: *Mimuri* 1231 (N).

*VITEX MICRANTHA* Gürke

Additional bibliography: Mold., Phytologia 48: 462 (1981) and 49: 366. 1981.

*VITEX MICROPHYLLA* Mold.

Additional bibliography: Mold., Phytologia 46: 40. 1980; Mold., Phytol. Mem. 2: 252 & 592. 1980.

*VITEX MILNEI* Pieper

Additional bibliography: Mold., Phytologia 46: 40. 1980; Mold., Phytol. Mem. 2: 212, 215, & 592. 1980.

*VITEX MOLLIS* H.B.K.

Additional & emended bibliography: Walp., Repert. Bot. Syst. 4: 85. 1845; Bocq. in Baill., Rec. Obs. Bot. 3: 253. 1863; Gentry, Carnegie Inst. Wash. Publ. 527: 23, 33, 37, 42, 45, 66, 223, 224, & 306. 1942; Mold., Phytologia 49: 167 & 451. 1981; Janzen & Martin, Science 215: 23. 1982.

Recent collectors refer to this species as a tree, 6 m. tall, with fissured bark, and edible fruit -- "las hojas como thé para aliviar la tos y como estimulante; su sabor y olor esperecido al de el thé negro". They have encountered it in rocky, sunny or calcareous soil, in oak woods, and in low deciduous woods with *Juniperus* at 300--1650 m. altitude, in flower in March and December, and in fruit in April. They record the vernacular names, "atuto" and "nanche de perro". The corollas are said to have been "purple" on *Sousa S.* 3908 and "pale-purple" on *Sota Nuñez* &

Zarate P. 1259.

The Forment 887, distributed as *V. mollis*, appears to be *V. hemsleyi* Briq., while Forment 768 is the closely related *V. kuylenii* Standl.

Additional citations: MEXICO: Guerrero: Sota Nuñez & Ramos 551 (Me--284054); Sota Nuñez & Zárate P. 1259 (Me--284173). Jalisco: Herb. Coll. Idaho s.n. [7/24/61] (Me--286929); Magallanes 372 (Ld); Sousa S. 3908 (Ld). Michoacán: Medrano, López, & Dirzo M. 5819 (Me--293571); Sota Nuñez & Zárate P. 1302 (Me--284070). Puebla: Weedons M.701 (Me--287012, N).

*VITEX MOMBASSAE* Vatke

Additional bibliography: White & Angus, Forest Fl. N. Rhodes. 371. 1962; Mold., Phytologia 48: 462--465 (1981) and 49: 377 & 378. 1981.

*VITEX MOSSAMBICENSIS* var. *OLIGANTHA* (J. G. Baker) Pieper

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 316 & 327. 1900; Mold., Phytologia 48: 466. 1981.

*VITEX NEGUNDO* L.

Additional & emended bibliography: Walp., Repert. Bot. Syst. 4: 89--90. 1845; Lindl., Veget. Kingd., ed. 1, 664 (1846), ed. 2, 664 (1847), and ed. 3, 664. 1853; Bocq. in Baill., Rec. Obs. Bot. 3: 253. 1863; Koord., Excursionsfl. 3: 136 & 495. 1912; Heyne, Nutt. Plant. Ned. Ind., ed. 2, 1: 24 (1927) and ed. 2, 3: 1646. 1927; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 199, 200, 206, 210, & 211. 1928; White, Journ. Arnold Arb. 10: 264. 1929; Guillaum., Journ. Arnold Arb. 13: 27. 1932; Corner, Wayside Trees, ed. 2, 707, 708, & 710. 1952; Kutuzkina, Paleont. Journ. Akad. Nauk SSSR 3: 158, fig. 2. 1970; Willaman & Li, Lloydia 33, Suppl. 3a: 220. 1970; Bennett, Fl. Howrah 306. 1976; Hsiao, Fl. Taiwan 4: 432--434, pl. 1060; Li, Nan-fang 100--102 & 168, fig. 29 & 30. 1979; Biswas & Maheswari, Journ. Bomb. Nat. Hist. Soc. 77: 225. 1980; J. T. & R. Kartesz, Syn. Checklist Vasc. Fl. 2: 468. 1980; Pant, Uniyal, & Prasad, Journ. Bomb. Nat. Hist. Soc. 78: 51. 1981; Mold., Phytologia 49: 167--181 & 457 (1981) and 50: 238, 251--253, 267, & 269. 1982.

Additional illustrations: Kutuzkina, Paleont. Journ. Acad. Nauk SSSR 3: 158, fig. 2. 1970.

Merrill (1923) states that this species is found "Throughout the Philippines at low and medium altitudes, in waste places, thickets, etc., often common", giving its overall distribution as "Tropical East Africa, Madagascar, India to Japan, southward through Malaya to western Polynesia".

Corner (1952) calls this the "Horse-shoe Vitex", listing the vernacular names, "lagundi", "lemuning", and "lenggundi". He describes the plant as "Like *V. trifolia* but:--Leaves with 3--5 leaflets, the middle leaflet distinctly stalked: leaflets with a long tip, the edge entire, notched, toothed or even deeply

lobed (nearly pinnately lobed): leaf-stalk longer, 1--2 1/2". Flowers smaller, 1/4 -- 1/3" long and wide: inflorescence as large branched terminal panicles 4--15" long and nearly as wide, the flowers closely set on short branches 1/2 -- 2" long: corolla pale to rather deep blue, often speckled, generally with a yellow horse-shoe like mark on the lower lip. Fruit .15" long, smaller, barely longer than the calyx. Trop. Africa to the Pacific: occurring like *V. trifolia* in Malaya, but commoner in gardens and certainly introduced."

Heyne (1927) lists the vernacular names, "ai toeban" and "lagoendi laoei laki laki", and gives the following statement about economic uses and chemistry: "Een afkooksel van den wortel geneest gezwollen en zuchtige lichamen en verdrijft de wormen. De bladeren, gekawd, genezen ulceratiën; gewreven, met peper gemengd en tot pillen gedraaid en twee of drie daarven ingenomen bij opkomende kiude koorts, verdrijven zij de koude....Greshoff...vond in den bast en de bladeren een chromogeen glucosied en Boorsma...een spoor alcaloïd."

Dop (1928) cites Poilane 1439, 1474, 6076, 7059, 8130, & 9585 from Annam, Godefroy 806 & s.n., Lefèvre 276, Pierre 389 & s.n., and Thorel 120 from Cochinchina, Thorel s.n. from Laos, Balansa 938, Bon 1086, 1636, & 1723, and Mouret s.n. from Tonkin, and Zimmermann s.n. from Thailand.

Biegel describes *V. negundo* as a shrub of open texture, 8 m. tall, with mauve-blue corollas, and found it growing at 1480 m. altitude, in anthesis in January.

Bennett (1976) cites Bennett 361 from West Bengal, while Biswas & Maheswari (1980) cite Biswas 116. Hsiao (1978) cites Henry 905, Nakazawa s.n., Tanaka 97, and Wilson 10972 from Taiwan. Guillaumin (1932) cites a no. 801 from Aneityum island in the New Hebrides, where, he avers, it is a common shrub to 3 m. tall on the seashore at sealevel, with leaves silvery beneath, and blue "flowers" and "fruit yellow when ripe". This is most certainly a misidentification for *V. trifolia* L. or one of its varieties, but the color given for the ripe fruit seems most questionable.

Banerji and his associates (1969) have isolated 5-hydroxy-3,6,7, 3',4'-pentamethoflavone from the leaves of what they have identified as *Vitex negundo*.

The Chun 3855, distributed as typical *V. negundo*, actually represents its var. *cannabifolia* (Sieb. & Zucc.) Hand.-Mazz., while Sinclair 5950 is var. *intermedia* (P'ei) Mold.

Additional citations: PHILIPPINE ISLANDS: Luzon: Ahern's collector 102 (It). CULTIVATED: Zimbabwe: Biegel 5802 (Ba--387164). MOUNTED ILLUSTRATIONS: Hsiao, Fl. Taiwan 4: 433, pl. 1060. 1978 (Ld).

*VITEX NEGUNDO* var. *CANNABIFOLIA* (Sieb. & Zucc.) Hand.-Mazz.

Additional synonymy: *Vitex cannabina* Beal, in herb.

Additional bibliography: Mold., Phytologia 49: 167--172, 175, 177, 179, & 457 (1981) and 50: 252. 1982.

Jativa describes this plant as a shrub, to 13 feet tall, 12 ft.

wide, the branches ascending-spreading, and the corollas "light-blue" (in June). The seed from which his plant was grown came from the Kirghistan Botanical Garden in Russia.

Additional citations: CHINA: Hupeh: *Chun* 3855 (It). CULTIVATED: California: *Jativa* 2940 [LASCA Acc. 67-S-888] (Ba--376680). Massachusetts: *Beal* s.n. [Aug. 20, 1862] (Ba--382430).

*VITEX NEGUNDO* var. *HETEROPHYLLA* (Franch.) Rehd.

Additional bibliography: Bocq. in Baill., Rec. Obs. Bot. 3: 253. 1863; E. D. Merr., Enum. Philip. Flow. Pl. 3: 395. 1923; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 206. 1928; Fosberg, Satchet, & Oliver, Micronesica 15: 239. 1979; J. T. & R. Kartesz, Checklist Vasc. Fl. 2: 468. 1980; Mold., Phytologia 49: 171--179 (1981) and 50: 253, 266, & 267. 1982.

Dop (1928) cites *Pierre* 4550 from Cochinchina. Meyer found the plant growing "on city walls" in Chili, China.

The type specimen (holotype) of the synonymous *V. chinensis* Mill., from the Chelsea Physic Garden, was photographed by Dr. L. H. Bailey as his type photograph number 5055.

The *Jativa* 2940, distributed as *V. negundo* var. *heterophylla*, actually represents var. *cannabifolia* (Sieb. & Zucc.) Hand.-Mazz., while *Barker* s.n. [July 22, 1923] is var. *heterophylla* f. *multifida* (Carr.) Rehd. and *Jack* 8172 is var. *intermedia* (P'ei) Mold.

Additional citations: CHINA: Chili: *F. N. Meyer* 1008 (It). CULTIVATED: England: *P. Miller* s.n. [Chelsea Physic Garden; Bailey Hort. neg. 5055] (Ld--photo, Ld--photo).

*VITEX NEGUNDO* var. *HETEROPHYLLA* f. *ALBA* (Carr.) Mold.

Additional & emended bibliography: Desf., Tabl. Ecol. Bot., ed. 1, 53. 1804; Mold., Phytologia 49: 177--178 (1981) and 50: 266 & 267. 1982.

*VITEX NEGUNDO* var. *HETEROPHYLLA* f. *MULTIFIDA* (Carr.) Rehd.

Additional bibliography: Mold., Phytologia 49: 176--178 (1981) and 50: 267. 1982.

Additional citations: CULTIVATED: Massachusetts: *Barker* s.n. [July 22, 1923] (It).

*VITEX NEGUNDO* var. *INTERMEDIA* (P'ei) Mold.

Additional bibliography: J. T. & R. Kartesz, Syn. Checklist Vasc. Fl. 2: 468. 1980; Mold., Phytologia 49: 171, 172, & 176--180 (1981) and 50: 253. 1982.

Sinclair refers to this plant as "a rare shrub in moderate flower and moderate unripe fruit" in August in Singapore, the corollas "lilac" in color. Jack refers to it as a 6-foot shrub.

Material has been misidentified and distributed in some herbaria as *V. negundo incisa* Clarke.

Additional citations: MALAYA: Singapore: *J. Sinclair* 5950 (W--2924160). CULTIVATED: Cuba: *J. G. Jack* 8172 (W--1555894), 8357 (W--1555950).

*VITEX NOVAE-POMMERANIAE* Warb., Engl. Bot. Jahrb. 13: 428. 1891.

Synonymy: *Vitex novae pommeraniae* Warb. apud K. Schum. & Lauterb., Fl. Deutsch. Schutzg. Südsee 524. 1900. *Viticipremna novae-pommeraniae* (Warb.) H. J. Lam, Verbenac. Malay. Arch. 163. 1919. *Viticipremna novo-pommeraniae* Menninger, 1960 Price List Flow. Trees [10]. 1960. *Viticipremna nova-pommeraniae* H. J. Lam apud Menninger, Flow. Trees World 298. 1962. *Viticipremna novaepommeraniae* Foreman, Div. Bot. Dept. For. N. Guin. Bot. Bull. 5: 178. 1972. *Vitex glabrata* "sensu Kaneh." ex Fosberg, Sachet, & Oliver, Micronesica 15: 239, in syn. 1979 [not *Vitex glabrata* Blume, 1956, nor R. Br., 1810, nor F. Muell., 1895].

Bibliography: Warb., Engl. Bot. Jahrb. 13: 428 & 429. 1891; K. Schum. & Lauterb., Fl. Deutsch. Schutzg. Südsee 524. 1900; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 457. 1906; H. J. Lam, Verbenac. Malay. Arch. 163--164, 214, & 370. 1919; Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 47. 1921; H. J. Lam, Engl. Bot. Jahrb. 59: 92. 1924; Fedde & Schust., Justs Bot. Jahresber. 47 (2): 246. 1929; Fedde, Justs Bot. Jahresber. 47 (2): 423. 1929; Junell, Symb. Bot. Upsal. 4: 94 & 95, fig. 143 & 144. 1934; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 457. 1941; Fedde & Schust., Justs Bot. Jahresber. 60 (2): 577. 1941; Mold., Alph. List Inv. Names 54. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 67, 68, & 104 (1942) and ed. 2, 149, 150, & 203. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 457. 1959; Mold., Résumé 202, 204, 387, & 479. 1959; Menninger, 1960 Price List Flow. Trees [10]. 1960; Menninger, Flow. Trees World 298. 1962; Mold., Fifth Summ. 1: 338 & 340 (1971) and 2: 724, 732, & 931. 1971; Foreman, Div. Bot. Dept. For. N. Guin. Bot. Bull. 5: 178. 1972; L. H. & E. Z. Bailey, Hortus Third 1162. 1976; Fosberg, Sachet, & Oliver, Micronesica 15: 239. 1979; Mold., Phytologia 44: 222 & 404. 1979; Mold., Phytol. Mem. 2: 328, 329, 368, 460, & 596. 1980; Mold., Phytologia 49: 455 (1981) and 50: 254, 266, 267, 269, & 270. 1982.

Illustrations: Junell, Symb. Bot. Upsal. 4: 95, fig. 143 & 144. 1934.

A shrub, 2 m. tall, or small, medium, or large tree, to 35 m. tall, pubescent with short, yellow-gray, slightly silky, glossy hairs; trunk (bole) to 20 m. high, to 1.5 m. in diameter at breast height, regular, smooth, yellow-brown, often buttressed for 2--2.5 m. or "spur-rooted to 30 inches, running into a broadly fluted stem"; crown medium-size, "light-yellow in general appearance", lightly leafy; outer bark gray-brown (or yellow-brown where peeling has taken place), about 1 cm. thick, with fine longitudinal fissures, small flakes peeling to 2 cm., corky in texture; under bark pale-green and "crumbly" or "light watery-brown"; inner bark about 9 mm. thick, yellow-brown, white when freshly cut (slash), later turning pale-green, brittle; wood straw-color or dark-straw, the sapwood not defined from the heartwood, soft and light, easy to cut, hard to split, with a slightly woolly cut on circular sawing, the pores moderately numerous to numerous, small, barely visible to the naked eye, arranged in short radial rows, the rays visible to the naked eye, not quite as wide as the pores,

the soft tissue diffuse, not conspicuous; young branchlets cinereous-pubescent or brown-tomentose; leaves decussate-opposite, 3--5-foliolate, yellow-green when young, darker green when older; petioles stout, 5--20 cm. long, cinereous-pubescent or brown-tomentose; petiolules brown-tomentose, 2--4.5 cm. long on the largest (central) leaflet, 8--10 mm. long on the smaller ones; leaflet-blades rigidly chartaceous, all petiolulate, oval or ovate-lanceolate to oblong or oblong-obovate, dull-green or dark-green and semi-glossy above, lighter green or mid-green beneath, usually widest above the middle, apically subobtusely acuminate, marginally entire, basally inequilaterally subobtuse or subacute, glabrous above, paler beneath and there marked with very small glands, drying brownish-gray above and olive-green beneath, the central one 12.2--22 cm. long and 6--7.5 cm. wide, the others steadily diminishing to 10 cm. long and 4 cm. wide; midrib and secondaries pubescent; secondaries 8--11 per side, only moderately arcuate; inflorescence terminal, paniculate, usually pedunculate, densely composite, robust, 14--18 cm. long, about 6 cm. wide, subequaling or longer than the subtending leaves, several times dichotomous from 3--4 cm. above the base, the branches opposite; peduncles to 20 cm. long; flower-buds small, inconspicuous, dull-green; flowers short-pedicellate, about 9 mm. long, fragrant; corolla bilabiate, internally tomentose, the throat villous, white [Streimann NGF.26189] to greenish-cream with a lilac lower lobe [Floyd 6646] or creamy with purple markings on the lower lip [Mair 1852]; fruiting-calyx persistent, large, accrescent, cupuliform, externally puberulent and glandulose, often 2-lobed or else the rim scarcely denticulate; fruit drupaceous, globose, 8--9 mm. long and wide, fleshy, externally glabrous, green when immature; seeds externally costate.

The species is based on material gathered in ravines of "Ratun auf den Gezellenhalbinsel" of New Britain. Warburg (1891) says that "Die Art steht der *V. acuminata* R. Br....sehr nahe, unterscheidet sich aber schon durch die Blattform und Grösse, durch die stets gestielten Blättchen, durch die Kleinheit der Frucht, die Behaarung des Fruchtkelches etc." The specific name is sometimes written with uppercase initial letters for both parts of the specific epithet (as by Junell, 1934). Foreman (1972) places *Vitex quinata* (Lour.) F. N. Will. in its synonymy, but the two taxa are quite separate, although obviously closely related. He comments that the wood of *V. novae-pommeraniae* is "much like that of *V. cofassus*" Reinw. "but has much better form."

The Baileys (1976) list *V. novae-pommeraniae* as occurring in cultivation, native to New Guinea, New Britain, and New Ireland, describing it as a "Shrub or large tree", the leaflets 3--5 in number, ovate or obovate-oblong, to 3 1/4 inches long, apically acuminate, marginally entire, the flowers borne in panicles to 7 inches long, the corollas yellow. Junell (1934) discusses and illustrates the gynoecium morphology.

Schumann & Lauterbach (1900) cite Hellwig 390 & 463 from north-eastern New Guinea and Dahl s.n. and Warburg s.n. from New Brit-

ain, and regarded it as endemic to these two islands. His publication is often cited as published in "1901", but it actually appeared in 1900. Lauterbach (1924) adds *Peckel 311* from New Ireland to collections seen, while Fedde & Schuster (1927) cite the species not only from New Britain, but also from New Guinea and New Zealand -- this last is obviously an error for New Ireland.

Collectors have encountered this plant in rainforests and in secondary lowland rainforests often burned by escaped garden fires, on rich brown loam soil, at 50--200 m. altitude, in full anthesis in February, March, June, and December, and in fruit in March and December. The corollas are described as "greenish-yellow," the lip violet-streaked" on *Dahl s.n.* and as simply "greenish-yellow" on *Peckel 311*. Floyd mistakenly describes the fruit as "berries" [they are drupes].

Vernacular names reported for the species are "garamut bitim" and "la vase". The wood is said to be used to make ax handles and as planks.

Citations: NEW GUINEA: Papua: *Streimann NGF.26189*(Ld, Mu). NEW GUINEAN ISLANDS: Los Negros: *Collector undesignated 546* (Ng--16978). BISMARCK ARCHIPELAGO: New Britain: *Croft & al. NGF.41409* (Mu); *Floyd 6436* (Ng--16887), *6646* (Bi, Bi, Ng--16883, W--2603269, W--2603270); *Mair 1852* (Ng--6557).

#### *VITEX OBOVATA* E. Mey.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 87. 1845; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Mold., *Phytologia* 49: 362. 1981.

#### *VITEX ORINOCENSIS* H.B.K.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 86. 1845; Bocq. in Baill., *Rec. Obs. Bot.* 3: 253. 1863; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Mold., *Phytologia* 49: 363--366 (1981) and 50: 246 & 248. 1982.

Gentry & Puig-Rosa refer to this plant as a tree, 4 m. tall, and have found it growing on inundated savannas.

Additional citations: VENEZUELA: Apure: *Gentry & Puig-Rosa 14336* (E--2892147). Barinas: *Ruiz Teran 1769* (E--2406802). BRAZIL: Bahia: *Mori & Benton 12868* (N).

#### *VITEX ORINOCENSIS* var. *MULTIFLORA* (Miq.) Huber

Additional synonymy: *Vitex orinocensis* var. *multifolia* (Miq.) Huber, in herb.

Additional bibliography: Mold., *Phytologia* 49: 363--366 (1981) and 50: 246. 1982.

Recent collectors refer to this plant as a tree, 5--15 m. tall, the trunk 18--25 cm. in diameter at breast height, the leaflet-blades shiny above, the peduncles reddish, and the fruit at first green, later turning black, ellipsoid, 1.5 cm. long, 1.1 cm. wide, juicy, edible when ripe, and have encountered it in disturbed woods and "in *Panicum maximum* pastures with only shade trees remaining of the original forest cover", at 80--200 m. altitude, in flower in May and October, and in fruit in June and December. The corollas

are said to have been "light-blue," with white nectar-guides, exterior of tube lavender, anthers dark-blue" on Lowrie & al. 575 and simply "blue" on Aristeguieta & Agostini 4574.

Additional & emended citations: VENEZUELA: Apure: Cuatrecasas 4150 (W--2780389). Cojedes: Delascio 4424 (E--2481730). Guárico: Aristeguieta & Agostini 4574 (N). Zulia: Bunting & Alfonzo G. 6453 (Ld); Bunting & Fucci 8336 (Ld); Davidse, González, & León 18385 (Ld); Steyermark, Davidse, & Stoddart 123069 (Ld), 123121 (Ld), 123144 (Ld). SURINAM: Florschütz & Maas 2787 (Ld). BRAZIL: Acre: Lowrie, Lowry, Nelson, Ferreira, Rosas, Morreira, & Sousa 575 (Ld). CULTIVATED: Venezuela: Croat 38245a (E--2892189).

*VITEX PACHYPHYLLA* J. G. Baker

Additional bibliography: Mold., Phytologia 49: 367. 1981.

A wood section accompanies the illustration cited below.

Additional citations: MOUNTED ILLUSTRATIONS: Assoc. Colon.-Scienc. Co. Nat. Bois Colon. Evino. 1928 (Ba).

*VITEX PANSHINIANA* Mold.

Additional bibliography: Mold., Phytologia 49: 367--368 & 447 (1981) and 50: 246. 1982.

*VITEX PARVIFLORA* A. L. Juss.

Additional & emended bibliography: Walp., Repert. Bot. Syst. 4: 84--85 & 91. 1845; Bocq. in Baill., Rec. Obs. Bot. 3: 253. 1863; E. D. Merr., Bull. Philip. Forest. Bur. 1: 51. 1903; Heyne, Nutt. Plant. Ned. Ind., ed. 1, 4: 113--114. 1917; Fedde & Schust., Justs Bot. Jahresber. 47 (2): 246. 1919; E. D. Merr., Enum. Philip. Flow. Pl. 3: 395--396. 1923; Heyne, Nutt. Plant. Ned. Ind., ed. 2, 1: 24 (1927), ed. 2, 2: 1317 (1927), and ed. 2, 3: 1646. 1927; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928; Hsiao, Fl. Taiwan 6: 122. 1980; J. T. & R. Kartesz, Syn. Checklist Vasc. Fl. 2: 468. 1980; Mold., Phytologia 49: 368--375 & 381 (1981), 49: 440, 443, 457, & 459 (1981), and 50: 253, 266, & 267. 1982.

Merrill (1923) comments that this species is found "Throughout the Philippines in all or most islands and provinces. Common in both secondary and open primary forests at low altitudes. This valuable timber tree, commercially known as molave, is common in many parts of the Philippines. It is represented by more than 225 individual collections [in the Manila herbarium, now destroyed]. The species is not closely allied to *V. cofassus* Reinw. and presents no intergrades with that species, of which Hallier considered it to be a variety. I have a photograph of Jussieu's type; it is identical with *V. littoralis* Decne. The inflorescences are often abnormal." He gives the extra-littoral distribution as "Saleyer, Timor, Java, Celebes, Amboina".

Schauer (1847) cites *Cuming* 1365 and 1830 from the Philippines and a *Herb. Mus. Paris* s.n. from Timor.

Biegel describes the corollas on his no. 5236 as "blue, the lip darkest and with a yellow patch near its base".

Additional citations: CULTIVATED: Cuba: *J. G. Jack* 8374 (W--1555893). Hawaiian Islands: *O. Degener* 11244 (It). Zimbabwe: *Biegel* 5236 (Ba).

*VITEX PARVIFLORA* var. *PUBERULENTA* Mold.

Additional bibliography: Mold., *Phytologia* 49: 374 (1981) and 50: 253 & 266. 1982.

*VITEX PARVIFLORA* f. *STERILIS* H. J. Lam

Additional bibliography: Mold., *Phytologia* 49: 373 & 375. 1981.

Additional citations: PHILIPPINE ISLANDS: Luzon: *Hagger* 255 (It).

*VITEX PAYOS* (Lour.) Merr.

Additional bibliography: White & Angus, *Forest Fl. N. Rhodes*. 372. 1962; Mold., *Phytologia* 49: 376--379 (1981) and 50: 250, 266, & 269. 1982.

Greenway (1969) cites *Greenway & Kabwie* 12530 from Tsavo East National Park.

*VITEX PEDUNCULARIS* Wall.

Additional & emended bibliography: Walp., *Repert. Bot. Syst.* 4: 91. 1845; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 172. 1895; Dop, *Bull. Soc. Hist. Nat. Toulouse* 57: 207 & 209--211, 1928; Kanjilal, Das, Kanjilal, & De, *Fl. Assam* 3: 479, 480, 484--485, & 561. 1939; Sharma, Shetty, Vivekan., & Rathakr., *Journ. Bomb. Nat. Hist. Soc.* 75: 33. 1981; Mold., *Phytologia* 49: 379--383 (1981) and 50: 267. 1982.

Sharma and his associates (1981) cite *Vivekananthan* 40805 from Tamil Nadu, India, describing the plant as a common tree with white "flowers" [corollas], at 950 m. altitude, flowering there in April. Craib (1911) cites *Kerr* 572 and *Vanpruk* 122 from Thailand, where it grows in mixed and deciduous jungles, at 300--450 m. altitude, giving its overall distribution as "Bengal, Assam, Burma". Dop (1928) cites *Hayata* 806 and *Poilane* 1356 & 7660 from Annam, *Harmand s.n.* and *Pierre* 649 from Cambodia, *Harmand s.n.*, *Lefèvre* 361, and *Pierre* 1865 from Cochinchina, and *Harmand* 417 & 1293 and *Thorel* 266 from Laos. He describes the species as a tree of the forests, 20--30 m. tall, very abundant on clay soils in Indochina, and records the vernacular names, "aloang conon", "cay chung vit", and "cay san trang". He comments, further, that "Poilane dit que c'est un bois rouge ou jaunâtre très dur, très bon pour tous travaux. Sa résistance aux termites est douteuse, bonne d'après les Annamites, mauvaise d'après les Moïs. Dans l'Indie Anglaise, au Pegu et au Tenasserim, ce bois est, d'après Kurz, recherché pour divers usages," and "Cette espèce présente quelquefois des feuilles 5-foliolées, papyracées ou subcoriaces".

Additional citations: BANGLADESH: *J. M. Cowan* 179 (It); *Majumder & Islam* 44 (Mi, Mi).

*VITEX PETERSIANA* Klotzsch

Additional bibliography: White & Angus, *Forest Fl. N. Rhodes*.

371. 1962; Mold., Phytologia 49: 384. 1981.

Gonde describes this species as a shrub, 6--8 feet tall, and encountered it on dark basaltic soil in mixed woodlands.

Additional citations: ZIMBABWE: Gonde 51/74 (W--2922191).

#### VITEX PIERREANA Dop

Additional bibliography: Mold., Phytologia 49: 432--433. 1981.

Dop (1928) comments that "Cette espèce est voisine du *V. Eberhardtii*. Elle s'en distingue par l'inflorescence, le calice pubescent, les fleurs plus petites."

#### VITEX PINNATA L.

Additional & emended bibliography: Blume, Cat. Gewass., imp. 1, 86. 1823; Walp., Repert. Bot. Syst. 4: 82--84 & 91. 1845; Bocq. in Baill., Rec. Obs. Bot. 3: 253. 1863; Koord., Meded. Lands. Plantent. 19: 560. 1898; Ridl., Journ. Roy. Asiat. Soc. Straits 57: 84 (1910) and 59: 157. 1911; Koord., Exkursionsfl. 3: 136 & 495. 1912; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 198, 199, 208, 210, & 211. 1928; Corner, Wayside Trees, ed. 1, pl. 216. 1940; Blume, Cat. Gewass., imp. 2, 86. 1946; Corner, Wayside Trees, ed. 2, 695, 706, 707, & 709--710, pl. 216. 1952; Mold., Phytologia 49: 373, 432--445, 452, 457, 459, & 468 (1981) and 50: 252--254, 267, 270, & 425. 1982.

Additional illustrations: Corner, Wayside Trees, ed. 1, pl. 216 (1940) and ed. 2, pl. 216. 1952.

Corner (1940) reports the vernacular name, "Malayan teak", for this species. Ridley (1910, 1911) describes the tree as "Common in open country", citing Ridley 14938 & 14939 from Perlis, giving its overall distribution as India, Burma, and Malaya.

Corner (1952) describes this species as "An evergreen tree up to 80 ft. high, flowering at 15 ft.: bark pale yellowish grey or ashen, somewhat fissured and flaky in long thin pieces, the inner bark light yellow, turning green on exposure to the air: crown shabby green, rounded but rather uneven, with the limbs arching out and with many small branches standing stiffly up from them: twigs, leaf-stalks, inflorescences and undersides of the leaves hairy. Leaves with 3--5 large, sessile leaflets, the outer two often small: middle leaflets 3--11 x 1 1/4 -- 4", elliptic, long-tipped, rather dull shabby green, with 13--20 pairs of side-veins: leaf-stalk 1--4" long. Flowers 2/3" long and wide, in large, conical or flattened, terminal panicles 3--10" long and wide, the greenish brown bracts conspicuous: corolla violet blue, the upper lobes bluish white. Fruit 1/3" wide, green, then dull purple and finally black, surrounded by the calyx 1/3" wide. S.E. Asia, Malaysia: common in villages, open country and by rivers and seashores throughout Malaya." He lists the additional vernacular names, "leban", "halban", and "haleban", and continues: "The Leban is one of the commonest trees of secondary jungle, its berries being sought after and distributed by birds. It is not a beautiful tree for the dull green leaves, which are often disfigured by galls or perforated by insects, and the untidy inflorescences with their dingy bracts give the crown a shabby, if unmistakable, look. It flowers and fruits

through the year. In the open it has a short trunk that soon breaks up into branches but in moderate shade it becomes a fairly lofty tree which in shape and branching greatly resembles the Teak (*Tectona*). The fissured bark is evidently suitable for the roots of epiphytic orchids so that the Leban is well-known to the hunter of wild orchids who quickly learns to scan the branches in search of rarities. The timber is hard and heavy and is used in villages for ploughs and other agricultural instruments. An intense yellow dye can be extracted from the bark. At Sepang, all the trees have white or yellowish-white flowers." The fruits, of course, are drupes, not berries.

Talib & Husin refer to the tree as medium-sized, to 30 feet tall, the bole 6 feet high, the girth 2 feet, the bark smooth and black, the inner bark yellowish, the sapwood orange-yellow, and the fruit "black-green" (in October). They have found it growing along roadsides in secondary forests. Krukoff records the Sumatran vernacular names, "alóban-bátu" and "alobanbúnga".

Additional citations: BANGLADESH: J. M. Cowan 432 (It); *Majumder & Islam* 120 (Mi, Mi). PHILIPPINE ISLANDS: Palawan: *Edano, Herb. Philip. Bur. Sci.* 77441 (Mi). GREATER SUNDA ISLANDS: Sabah: Talib B. & Husin SAN.84776 (Ld). Sumatra: Krukoff 314 (Mi), 335 (Mi).

*VITEX PINNATA* f. *PTILOTA* (Dop) Mold.

Additional bibliography: Mold., *Phytologia* 49: 432 & 444--445 (1981) and 50: 252, 254, 267, & 270. 1982.

*VITEX POLYGAMA* Cham.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 91--92. 1845; Bocq. in Baill., *Rec. Obs. Bot.* 3: 253. 1863; Mold., *Phytologia* 49: 368 & 446--448. 1981.

*VITEX PSEUDOLEA* Rusby

Additional bibliography: Mold., *Phytologia* 49: 450. 1981.

Schunke refers to this species as having "El tronco es semi-acanalado con los corteza rugosa de color amarilló-pardo. Las hojas son caducas. Diámetro del tronco 30". He reports the tree 34--40 m. tall, the corolla light-violet, and the stamens dark-violet. He encountered it in high forests, at 500--600 m. altitude, in flower in May.

Additional citations: PERU: San Martín: *Schunke Vigo* 8382 (Ld).

*VITEX PUBERULA* J. G. Baker

Additional bibliography: Mold., *Phytologia* 49: 450 (1981) and 50: 251. 1982.

Additional citations: ANGOLA: Loanda: *Welwitsch* 5668 [F. G. Mey. photo 2996] (W--photo of type).

*VITEX PYRAMIDATA* B. L. Robinson

Additional bibliography: Rzedowski, *Veget. Mex.* 186. 1978; Mold., *Phytologia* 49: 450--452. 1981.

The corollas are said to have been "blue" on *Mason & Mason* 3346.

Another vernacular name recorded for the species in Mexico is "tescalama".

Additional citations: MEXICO: Jalisco: *Herb. Coll. Idaho s.n.* [7/25/61] (Me--287041). Nayarit: *Herb. Coll. Idaho s.n.* [7/2/55] (Me--286931); *Mason & Mason* 3346 (Mi).

*VITEX QUINATA* (Lour.) F. N. Will.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 83, 87--89, & 91. 1845; Bocq. in *Baill., Rec. Obs. Bot.* 3: 253. 1863; Corner, *Wayside Trees*, ed. 2, 707 & 710. 1952; Hsiao, *Fl. Taiwan* 6: 122. 1980; Mold., *Phytologia* 49: 443 & 452--460 (1981) and 50: 253, 266, 267, & 270. 1982.

Corner (1952) describes this species as "A tree with light grey, shallowly ridged and fissured bark and bright orange inner bark: like *V. coriacea* [*Teijsmanniodendron coriaceum*] but: -- Leaflets 3--5, with 8--10 pairs of side-veins, scarcely leathery. Panicles 6--14" long, larger, with stout branches. Fruit pear-shaped with a small point, dark green (? yellow when ripe). India, W. Malaysia to the Philippines: not infrequent in the middle of Malaya."

Dop (1928) notes that "La règle de priorité veut, comme l'a fait Williams, que le binôme *V. quinata* soit substituée au binôme *V. heterophylla* adopté par la presque totalité des botanistes. Je n'ai pas rencontré cette espèce dans l'Herbier du Museum. D'ailleurs Loureiro la signale en Chine et non en Indochine." Actually, most of the non-Chinese specimens cited by authors, including myself in earlier installments of this work, prove to be *Vitex turczaninowii* Merr. rather than *V. quinata*. Chan describes the corollas as "cream-yellow, lower limb tinged purple" and found the tree in full flower in July.

Additional citations: CHINA: Kwangtung: *Tsang* 21194 (Mi), 21477 (Mi). CHINESE COASTAL ISLANDS: Hainan: *Fung* 20420 (Mi); *How* 70858 (Mi); *Lei* 66 (Mi), 714 (Mi); *Liang* 62220 (Mi); *Wang* 33204 (Mi), 33757 (Mi). HONG KONG: *Chan s.n.* [July 20, 1973] (Mi); *Hu* 8445 (Mi); *Taam* 1532 (Mi), 1846 (Mi).

*VITEX QUINATA* var. *SERRATA* Mold.

Additional bibliography: Mold., *Phytologia* 49: 460 (1981) and 50: 270. 1982.

*VITEX RADULA* Mildbr.

Additional bibliography: Mold., *Phytologia* 49: 460. 1981.

Phillips describes this plant as a tree, 8--10 feet tall, the fruit green in May, and have found it growing in rainforests, at 4010 feet altitude. Material has been misidentified and distributed in some herbaria as *V. buchanani* Baker.

Additional citations: MALAWI: *Phillips* 2159 (Ba--376242).

*VITEX RAPINI* Beauvis.

Additional bibliography: Guillaum., *Journ. Arnold Arb.* 13: 27.

1932; Mold., *Phytologia* 49: 460. 1981.

*VITEX REHMANNI* Gürke

Additional bibliography: Mold., *Phytologia* 49: 462--463 (1981) and 51: 214. 1982.

*VITEX RUFESCENS* A. L. Juss.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 85 & 86. 1845; Mold., *Phytologia* 49: 464--465 (1981) and 50: 248 & 270. 1982.

*VITEX RUFESCENS* var. *PARAENSIS* Mold.

Additional bibliography: Mold., *Phytologia* 49: 465 (1981) and 50: 248 & 270. 1982.

*VITEX SCABRA* Wall.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 91. 1845; Mold., *Phytologia* 49: 465. 1981.

*VITEX SCANDENS* Mold.

Additional bibliography: Mold., *Phytologia* 49: 465--466. 1981.

Streimann & Kairo describe this plant as a "Climber, leaves glossy on both sides, lighter green beneath, petals velvet red".

Additional citations: NEW GUINEA: Territory of New Guinea: Streimann & Kairo NGF.21102 (W--2916868).

*VITEX SCHAUERIANA* Mold.

Additional bibliography: Mold., *Phytologia* 49: 466. 1981.

The Duarte 3060 [Herb. Jard. Bot. Rio Jan. 73512], distributed as *V. schaueriana*, seems actually to be *V. megapotamica* (Spreng.) Mold.

*VITEX SCHOMBURGKIANA* Schau.

Additional bibliography: Mold., *Phytologia* 49: 466--467 (1981) and 50: 267. 1982.

Additional citations: BRAZIL: Roraima: Prance, Steward, Ramos, Farias, & Monteiro 9578 (Mi).

*VITEX SELLOWIANA* Cham.

Additional bibliography: Walp., *Repert. Bot. Syst.* 4: 89. 1845; Mold., *Phytologia* 49: 469. 1981.

*VITEX SIAMICA* F. N. Will.

Additional bibliography: Ridl., *Journ. Roy. Asiat. Soc. Straits* 59: 157. 1911; Corner, *Wayside Trees*, ed. 2, 708. 1952; Mold., *Phytologia* 48: 490 (1981) and 49: 469. 1981.

Williams' original (1905) description of this species is: "Fru-tex? Ramuli teretes laeves glabri, lenticellis albis conspersi. Folia ternata; petiolo communi 3 1/2 -- 4 cm., glabro tereti. Foliola 6--9 cm. long., 2 1/2 -- 3 1/2 cm. lat., superiora minora; ovato-lanceolata acuminata, basi rotunda, coriacea, glabra, nervis

13--15-jugis, subtus vix prominentibus; petioluli 1 -- 1 1/2 cm. Inflorescentia paniculata; panícula 16--20 cm., ramis suberectis multifloris puberulis. Calyx cyathiformis, extus aspero-puberulus, dentibus 5 brevibus acutis, sinibus levissime excavatis, in fructu auctus incrassatus. Drupa sect. transversa 3 1/2 mm., ovato-globosa tetrasperma nigra. -- *V. negundo* et *V. trifoliae* affinis." He cites as cotypes "*Teruto* (1888), *Coah* (1892), *Curtis*, n. 1683" from the Langkawi Archipelago. Dop (1928), citing only *Curtis* 1683, says: "Je n'ai pas rencontré cette espèce en Indochine française. Je le signale à cause de son nom spécifique et de l'étroite parenté qu'elle présente avec le *V. ajugaeflora*."

Ridley (1911) cites the species from Langkawi, Dayong Bonting and Kwah on the basis of *Fox s.n.*, *Ridley* 12720, and *Curtis* 1683 from "Limestone rocks and Selangor".

Fletcher (1938) cites *Curtis* 1683, *Fox* 12720, *Haniff & Nur* 7079, *Henderson* 21385 & 23094, *Kerr* 10948, 13175, 17317, 18775, & 18923, *Put* 1025, 1378, 1643, & 4149, and *Rabil* 307 from Thailand. He notes that "*Kerr* 18923 and *Rabil* 307 have been referred to this species in spite of the fact that the ovary is distinctly pilose. In every other way the plants are so identical with this species that the writer does not feel justified in separating them." Possibly a varietal or form designation would be appropriate.

Recent collectors describe *V. siamica* as a small tree, 2--10 m. tall, shrubby treelet, "dangling shrub", or climber, the trunk to 15 cm. in diameter at breast height, the bark marked with many pale lenticels, the flowers visited by bees, and the sepals green. The corollas are said to have been "blue" on *Balgooy* 2306, "pale-lilac" on *Stone* 5894, "pale-lilac lip with a central yellow patch" on *Stone* 6922, "pale-lavender" on *Stone* 9516, "white" on *Stone* 6994, and "white/yellow" on *Chung* 46.

Collectors have found the species growing on sandy shores, cliffs, and dry rocky summits, in limestone crevices, in rocky limestone ground, and on limestone hills, hill summits, and ridgetops, in anthesis in February, May, July, August, and November, and in fruit in August. *Stone* refers to it as "common", "fairly common", and "rather common".

Material of this species has been misidentified and distributed in some herbaria as *V. negundo* L. and *V. trifolia* L. On the other hand, the *B. C. Stone* 8931, distributed as *V. siamica*, actually is *V. gamosepala* W. Griff.

Additional citations: MALAYA: Kelantan: *Chin* 1388 (Kl--19924); *B. C. Stone* 7466 (Kl--8257), 9516 (Kl--12365). Selangor: *Chung* 46 (Kl--19924); *B. C. Stone* 5894 (Kl--5626). MALAYAN ISLANDS: Bumbon Besar: *Balgooy* 2306 (Ac, N). Langkawi: *Keng & al.* K.6223 (Ac); *B. C. Stone* 6922 (Kl--7788), 6994 (Kl--7858). Timun: *Turnau* 773 (Kl--2773).

#### VITEX SIMPLICIFOLIA Oliv.

Additional & emended bibliography: J. G. Baker in *Thiselt.-Dyer*, *Fl. Trop. Afr.* 5: 315, 320, 322, & 323. 1900; Fedde & Schust.,

Justs Bot. Jahresber. 57 (2): 403 (1938) and 60 (2): 576. 1941; H. N. & A. L. Mold., Pl. Life 2: 82 & 88. 1948; Kershaw, Veget. Act. Geobot. 15: 249, 258, 261--265, & 267. 1967; Hocking, Excerpt. Bot. A.13: 569. 1968; Kershaw, Journ. Ecol. [Brit.] 56: 473. 1968; Mold., Phytologia 17: 38--40. 1968; Mold., Résumé Suppl. 16: 7 & 29. 1968; Mold., Biol. Abstr. 50: 942. 1969; Mold., Fifth Summ. 1: 210, 211, 217, 221, 223, 225--227, & 234 (1971) and 2: 716, 727, 731, & 929. 1971; Mold., Phytologia 23: 420. 1972; Lewis & Elvin-Lewis, Med. Bot. 257. 1977; Mukherjee & Chanda, Trans. Bose Res. Inst. 41: 53. 1978; Mold., Phytologia 44: 388 (1979) and 46: 31. 1980; Mold., Phytol. Mem. 2: 201, 202, 207, 210--213, 215, 216, 218, 224, & 594. 1980; Mold., Phytologia 46: 486. 1980.

The *Vitex bakeri* B. L. Robinson and *V. schweinfurthii* Baker, previously regarded by me as synonyms of *V. simplicifolia* Oliv., should be deleted from its synonymy. *Vitex bakeri* is a valid taxon, very different from the type collection of *V. simplicifolia*.

*Vitex simplicifolia* is said by Kershaw (1968) to be a member in Nigeria of the *Gardenia erubescens*--*Detarium microcarpon* plant association growing on massive vesicular laterite mounds, on ironstone concretions in the *Isoberlinia*--*Detarium* association and in the *Isoberlinia*--*Uapaca* association. He says that it is abundant with *Detarium microcarpon* and *Combretum binderianum* in ironstone areas, restricted in other areas, the inhibitory properties of manganese offering a possible explanation of this phenomenon, but it is not definitely known whether manganese is universally present in ironstone deposits or whether the pH falls sufficiently to mobilize it. He also reports that this species, along with *Combretum binderianum* and *Crossopteryx febrifuga*, is characteristic of the ironstone areas of Nigeria. Lewis & Elvin-Lewis (1977) state that in the Ivory Coast a decoction is made from *V. simplicifolia* and is used in the treatment of snake-bite.

Huber (1963) refers to the species as "A small tree or shrub with dense, pale indumentum and mauve flowers [corollas]", inhabiting savannas. Drar (1970) found it in fruit in April in the Kordofan of Sudan.

The *Schweinfurth 1519*, previously cited by me as *V. simplicifolia*, are now regarded by me as representing *V. bakeri* B. L. Robinson.

#### *VITEX SIMPLICIFOLIA* var. *VOGELII* (J. G. Baker) Pieper

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 57 (2): 403. 1938; Mold., Phytologia 17: 39--40. 1968; Mold., Fifth Summ. 1: 223 & 225--227 (1971) and 2: 731 & 929. 1971; Mold., Phytol. Mem. 2: 213, 215, 216, 218, & 594. 1980.

#### *VITEX SNETHLAGIANA* Huber

Additional bibliography: Mold., Phytologia 17: 40. 1968; Mold., Fifth Summ. 1: 180 (1971) and 2: 929. 1971; Mold., Phytol. Mem. 2: 172 & 594. 1980.

*VITEX SPRUCEI* Briq.

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 60 (2): 576. 1941; Egler, Bot. Mus. Para. Goeldi, ser. 2, Bot. 18: 80. 1963; Mold., Phytologia 17: 40. 1968; Mold., Fifth Summ. 1: 180 (1971) and 2: 725, 728, & 929. 1971; Porto, Longhi, Citadini, Ramos, & Mariath, Act. Amaz. 6: 304, 311, 312, & 316. 1976; Mold., Phytologia 36: 35. 1977; López-Palacios, Revist. Fac. Farm. Univ. Andes 20: 34. 1979; Mold., Phytol. Mem. 2: 112, 172, 460, & 594. 1980.

Recent collectors describe this plant as a bush or tree, to 20 m. tall, "muito copada", with fragrant flowers and green [immature] fruit, in flower in May, and in fruit in January. The corollas are said to have been "white" on Barata & Coelho s.n. and "white with purple on the larger petal" on Schultes & López 9949. Collectors have encountered it "at water's edge" and report the vernacular names, "leão-bravo" and "pião bravo".

Porto and her associates (1976) assert that this species is part of a *Vitex*--*Micrandra* ecologic community. They assert that *Vitex sprucei*, along with *Carapa guianensis* Aubl., *Jessenia bataua* (Mart.) Burret, and *Euterpe precatoria* Mart., are very frequent in the lowland associations. "Sendo *Vitex sprucei* Briq. a espécie mais uniformemente distribuída e de maior frequência dentro do grupo de espécies consideradas associadas, podemos denominar a vegetação estudada de comunidade *Vitex*--*Micrandra*.... Dentro da comunidade *Vitex*--*Micrandra* temos, a rigor, somente uma unidade de vegetação.... Quanto ao aspecto estrutural da vegetação pode-se afirmar existirem na comunidade *Vitex*--*Micrandra* 3 estratos bem definidos: um herbáceo.... representado predominantemente por *Rapateaceae*, *Marantaceae*, *Cannaceae*, *Zingiberaceae* algumas *Pteridophyta*."

Additional citations: BRAZIL: Amazonas: Barata & Coelho s.n. [11/01/1968] (W--2920780); Prance, Pena, Ramos, & Monteiro 3938 (S); Rodrigues & Lima 4733 [Herb. Inst. Nac. Pesq. Amaz. 13259] (N); Schultes & López 9949 (W--1996970, W--1996971). Roraima: Murça Pires & Leite 14845 [320] (N).

*VITEX SPRUCEI* var. *LONGIDENTATA* (Mold.) Mold.

Additional bibliography: Mold., Phytologia 17: 40. 1968; Mold., Fifth Summ. 1: 180 (1971) and 2: 728 & 930. 1971; Mold., Phytol. Mem. 2: 172 & 594. 1980.

*VITEX SPRUCEI* var. *VAUPESENSIS* Mold.

Additional bibliography: Mold., Phytologia 17: 40. 1968; Mold., Fifth Summ. 1: 121 (1971) and 2: 930. 1971; López-Palacios, Revist. Fac. Farm. Univ. Andes 20: 34. 1979; Mold., Phytol. Mem. 2: 112, 172, 460, & 594. 1980.

Additional citations: BRAZIL: Amazonas: Steward, Araujo, Rogers, Ramos, & Ribamar 428 (N).

*VITEX STAHELII* Mold.

Additional & emended synonymy: *Vitex staheli* Mold., Alph. List

Inv. Names Suppl. 1: 29, in syn. 1947; López-Palacios, Revist. Fac. Farm. Univ. Andes 15, 96, 97, & 102. 1975. *Vochysia racemosa* Lam., in herb.

Additional bibliography: Mold., Mutisia 6: 4. 1952; Mold., Phytologia 17: 40--41. 1968; Rollet, Adansonia, ser. 2, 8: 549. 1968; J. A. Steyermark, Act. Bot. Venez. 3: 72, 83, & 156. 1968; Mold., Fifth Summ. 1: 121, 128, 131, & 133 (1971) and 2: 728 & 930. 1971; Mold., Phytologia 28: 437. 1974; López-Palacios, Revist. Fac. Farm. Univ. Andes 15: 96, 97, & 102. 1975; Mold., Phytologia 34: 257. 1976; López-Palacios, Fl. Venez. Verb. 581 & 623--627, fig. 145. 1977; López-Palacios, Revist. Fac. Farm. Univ. Andes 20: 34. 1979; Mold., Phytologia 44: 399 & 412. 1979; Mold., Phytol. Mem. 2: 112, 121, 124--126, & 594. 1980; Mold., Phytologia 49: 365 (1981) and 50: 246. 1982.

Illustrations: López-Palacios, Fl. Venez. Verb. [624], fig. 145. 1977.

Recent collectors describe this plant as a low-branched tree, 10--28 m. tall, nearly leafless during anthesis, the trunk 35--102 cm. in diameter at breast height, the bark shallowly and finely fissured, brownish-gray, the leaflets papery or firmly membranous, rich- or medium-green and slightly glossy above, paler green and dull beneath, calyx green, and the fruit subglobose, smooth, glossy, purple or dull-purple, finally black when mature. They have encountered it in semi-evergreen or deciduous forests, tall-tree primary forests (the trees 3--35 m. tall), and on savannas, rocky hillsides with semi-deciduous forests, at 50--400 m. altitude, in flower in April, October, and November, and in fruit in May and November. They record the additional vernacular names, "aceituno", "guarataro", and "totumillo morado".

The corollas are said to have been "purple" on Blanco 476 & 490, "blue, the throat white" on Davidse & González 16376, "violet" on Sastre 6173, "violet, the large lobe more intensely so than the others" on Bunting 5672, and "blue, with white nectar-guides" on Davidse & González 16564.

Prévost describes the tree as "defolié et entièrement recouvert de fleurs bleu-mauves. Sexualité axillaire et ramiflorie, par inflorescences pédonculées à multiples fleurs zygomorphes, 1.5 cm. de long, à gorge blanche sticées de violet, 4 étamines. Les nouvelles unités de croissance apparaissent. Les feuilles sont opposées, pétiolées et tri- or pentafoliolées."

The Herb. Poirlet s.n. collection, cited below, is probably the holotype of *Vochysia racemosa* Lam. since it is annotated in Lamarck's own handwriting as "*Vochysia racemosa* m." My good friend and colleague, Dr. Alicia Lourteig, avers that it has been photographed in the Paris herbarium as "type (?) of *Vochysia racemosa*". Steyermark has suggested that it may be an *Aegiphila* species. An unknown Dutch hand has added "The 4 (5?) stamens are attached to the corolla throat, alternating with the lobes, at the place of attachment there is a hairy ring in the corolla-throat; anthers?; the ovary is 2-celled, with 4 ovules, apical, anatrop., the upper part hairy; style 1, forked (?)."

Steyermark cites (1968) for *Vitex stahelii*, from Venezuela, Blan-

co 476 & 490 and Marcano 143 & 163, while López-Palacios (1977) cites, from the same country, the following collections: Bolívar: Cardona 2119, Conejos 97, Little 17659, Rodríguez 2623, Williams 12696. Delta Amacuro: Blanco 475, 490, & 514, Marcano-Berti 143 & 163, Rusby & Squires 84 & 257, Wurdack & Monachino 39648.

Material of this species has been misidentified and distributed in some herbaria as *Vitex compressa* Turcz., *V. triflora* Vahl, and *Tabebuia* sp. On the other hand, the Breteler 3907, distributed as *V. stahelii*, actually is *V. orinocensis* var. *multiflora* (Miq.) Huber. López-Palacios informs us that *V. stahelii* may be distinguished from *V. orinocensis* var. *multiflora* by having its peduncles shorter than the petioles and by the fact that it is an upland (not a lowland) species.

Additional citations: VENEZUELA: Amazonas: Steyermark, Davidse, & Guanchez 122353 (Ld). Bolívar: Ll. Williams 12696 (N, Ve--12852). Delta Amacuro: Berti 163 (N, N); C. Blanco 476 (N, W--2557722), 490 (N, W--2557694), 514 (N, W--2557104); Davidse & González 16376 (Ld), 16564 (Ld). Táchira: Steyermark & Liesner 119159 (E--2773255). Zulia: Bunting 5672 (Ld); Trujillo 10974 (Eu--47848). FRENCH GUIANA: Herb. Poirer s.n. (P); Prévost 382 (Ld); Sastre 6173 (Cy).

#### VITEX STELLATA Mold.

Additional bibliography: Mold., Phytologia 17: 41. 1968; Mold., Fifth Summ. 1: 263 (1971) and 2: 930. 1971; Mold., Phytologia Mem. 2: 252 & 594. 1980.

#### VITEX STRICKERI Vatke & Hildebr.

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 315 & 318. 1900; Dale & Greenway, Kenya Trees 592 & 597--598. 1961; Mold., Phytologia 17: 41. 1968; Greenway, Journ. East. Afr. Nat. Hist. Soc. Nat. Mus. 27: 196. 1969; Gillett, Numb. Check-list Trees Kenya 47. 1970; Mold., Fifth Summ. 1: 234, 239, & 242 (1971) and 2: 725, 728, & 930. 1971; Mold., Phytologia 44: 389 (1979) and 46: 11. 1980; Mold., Phytol. Mem. 2: 224, 228, 232, & 594. 1980.

Recent collectors describe this plant as a bush, scrambling shrub, or creeping woody vine or liana of vigorous growth, or even as a coppice-growing tree, growing singly or in groups, profusely leafy, 1--8 m. tall, the stems erect, purple-brown, the branchlets brown-pubescent, tips of the twigs with orange-colored pubescence, the bark dark gray-brown, glabrous, smooth or rough, the sap colorless, the leaves 3-foliolate, very dry, soft dull-green, rough, the flowers hairy, slightly to strongly aromatic, the calyx 2-lipped, the corolla 1-sided, the stamens 4, attached within the corolla, the filaments hairy, and the fruit hard and edible. They have found it growing in loose brown or sandy soil at the edge of forests or thick cover, "in thick forests on gravel and black cotton soil", in sand near beaches, in old cultivated areas, in thickets on red loam, along streams in ravine thickets, on ant-hills, among rocks on hillsides, along roadsides near swamps, on rocky slopes, and in *Acacia--Commiphora* woodlands, from sealevel

to 200 m. altitude, in flower from November to April, July, and August, and in fruit from March to June.

The corollas are said to have been "white" on *Perdue & Kibuwa 8058* and *Tanner 1305, 2383, 2872, 3422, 3427, & 3986*, "cream" on *Burt 4640*, "yellowish-white" on *Strid 2796*, "lime-white" on *Tanner 630 & 3420*, "yellow-pink" on *Leippert 5513*, "pale-pink" on *Tanner 2065*, "lilac" on *Schlieben 5623*, and "largest lip purple, otherwise white" on *Archbold 1615*.

Leippert refers to the species as "common" in brushland where the rainfall is 700 mm. per year. Archbold mistakenly calls the drupaceous fruit a "berry".

Baker (1900) describes *V. strickeri* as "A shrub 5--6 ft. high; branchlets densely clothed with short brown pubescence. Leaves trifoliolate, subcoriaceous, scabrous above, densely pubescent with raised main veins beneath; leaflets ovate, acute, 1 1/2 -- 2 in. long, entire or slightly toothed, end one shortly petioled; main petiole densely pubescent, 1 in. long. Cymes forming a thyrsoid terminal panicle 2--4 in. long; branches very pubescent; pedicels very short. Calyx campanulate, pubescent, minutely toothed, 1/12 in. long at flowering. Corolla pubescent, twice as long as the calyx. Drupe yellow, glossy, glabrous, the size of a pea." Gürke (1895) describes it as "Ein mehrere Meter hoher Str[auch] mit ziemlich kleinen, 3zähligen B[lätter] und etwas erbsengrossen, hellbraunen Fr[üchte], in Buschgehölzen."

Dale & Greenway (1961) assert that *V. strickeri* is "Doubtfully distinct" from *V. lamiana* Pieper, claiming that it inhabits the coastal areas of Kikuyu and Teita.

Additional vernacular names recorded for *V. strickeri* are "mhamu", "mkungulungo", "mpulu'ngosha", "mugombo", "mukakinga", "mukichano", and "mvumba".

*Mhoro 1190* is placed here tentatively as its fruits seem to be borne solitary or paired at the ends of very short twigs.

The leaves of *V. strickeri* are used by natives to treat swollen gums. For this purpose the leaves are cooked and the resulting liquid is used to rinse the mouth. The roots are also boiled and the resulting liquid is drunk to alleviate "sharp stomach ache". The juice of pounded leaves is taken orally to combat snakebite or is "used directly for cobra poison in the eyes".

Baker (1900) cites unnumbered Hildebrandt and Kirk collections from Tanzania and of Wakefield from Mombasa. Dale & Greenway (1961) cite *Battiscombe 807*, *Gardner 2989*, *Wakefield s.n.*, and *Williams 320* from Kenya. Greenway (1969) cites *Sheldrick TNP/E/R 74* from Tsavo East National Park.

The Mearns collections, cited below, were previously erroneously cited by me as *V. volkensii* Gürke.

Additional citations: TANZANIA: Tanganyika: *Archbold 1615* (Ld); *Burt 4640* (Mu); *Endlich 777* (Mu), *777a* (Mu); *Leippert 5513* (Mu); *Mhoro 1190* (Tz); *Schlieben 5623* (Mu); *Tanner 630* (N), *1305* (N), *2065* (Ba, N), *2383* (Ba, N), *2872* (Ba, N), *3420* (Ba, N), *3422* (Ba, N), *3427* (Ba), *3986* (Ba, N). KENYA: *Mearns 262* (W--630276), *269* (W--630284); *Perdue & Kibuwa 8058* (Mu); *Strid 2796* (Go).

*VITEX STYLOSA* Dop

Additional & emended bibliography: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 201--202 & 210--211. 1928; Fedde & Schust., Justs Bot. Jahresber. 56 (2): 286. 1937; Mold., Phytologia 17: 41. 1968; Mold., Fifth Summ. 1: 303 (1971) and 2: 930. 1971; Mold., Phytol. Mem. 2: 294 & 594. 1980.

*VITEX SUMATRANA* Miq.

Additional & emended bibliography: Miq., Fl. Ind. Bat. Suppl. 1: 242 & 567--568. 1860; Kurz, Forest Fl. Brit. Burma 2: 271 & 612. 1877; C. B. Clarke in Hook. f., Fl. Brit. India 4: 586. 1885; S. Moore, Journ. Bot. Lond. 63: Suppl. 81. 1925; Dop, Bull. Soc. Hist. Nat. Toulouse 57: 201 & 210--211. 1928; Fletcher, Kew Bull. Misc. Inf. 1938: 432 & 434. 1938; Fedde & Schust., Justs Bot. Jahresber. 60 (2): 576. 1941; Mold., Phytologia 17: 30 & 41. 1968; Mold., Fifth Summ. 1: 285 & 329 (1971) and 2: 728 & 930. 1971; Mold., Phytol. Mem. 2: 274, 319, & 594. 1980.

The Moore (1925) reference in the bibliography (above) is often cited to "Rendle" or "S. Moore in Rendle", but it seems that Moore alone was the author.

Clarke (1885) comments, under *V. urceolata* C. B. Clarke, that "The inflorescence, calyx, corolla and drupe are so like those of *V. sumatrana*.....that it may be a variety of it; but in *V. sumatrana* the leaves are mostly 5-foliolate and pubescent beneath."

Dop (1928) says "Cette espèce me paraît avoir été souvent confondue avec le *V. quinata* Williams, avec lequel elle présente une ressemblance telle que Koorders et Valetton ont réuni les deux espèces. Cependant, il existe un caractère important très net sur lequel King et Gamble.....ainsi que Lam.....ont insisté: c'est que la corolle est entièrement glabre en dedans dans *V. sumatrana* et n'offre pas l'anneau de poils blancs que l'en observe dans presque tous les *Vitex* à l'insertion des étamines. J'ai pu m'assurer que la forme des folioles (non acuminées ou courtement et brusquement ou longuement acuminées) n'avait aucune valeur différentielle. J'ai la conviction que la plupart des plantes chinoise rapportées au *V. quinata* Williams appartiennent au *V. sumatrana* var. *urceolata*. Les échantillons récoltés à Hai nan par Henry.... appartiennent sans aucun doute à cette dernière espèce."

*VITEX SWYNNERTONII* S. Moore

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 39 (2): 320. 1913; Mold., Phytologia 17: 41. 1968; Mold., Fifth Summ. 1: 253 (1971) and 2: 930. 1971; Mold., Phytol. Mem. 2: 242 & 594. 1980.

The original type (holotype) specimen of this species, *Swynnerton 1054* was photographed in the British Museum herbarium as Missouri Botanical Garden type photograph number A.850.

Additional citations: MOZAMBIQUE: Gazaland: *Swynnerton 1054* [Missouri Bot. Gard. photos A.850] (Gz--photo of type, N--photo of type, W--photo of type).

*VITEX TANGENSIS* Gürke

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 316 & 321--322. 1900; Chiov., Result. Scient. Miss. Stef. 1: 144. 1916; Chiov., Fl. Somalia 1: 63. 1929; Glover, Prov. Check List Brit. Ital. Somal. 268. 1947; Dale & Greenway, Kenya Trees Shrubs 593 & 598. 1961; Mold., Phytologia 17: 41--42. 1968; Mold., Fifth Summ. 1: 239, 242, & 253 (1971) and 2: 726 & 930. 1971; Mold., Phytologia 23: 420 (1972) and 44: 390. 1979; Mold., Phytol. Mem. 2: 204, 228, 232, 242, & 594. 1980.

A many-stemmed shrub or small tree, 12--20 feet tall; branchlets short, yellowish- or drab-pubescent; leaves mostly 3- or occasionally 5-foliolate, distinctly petiolate; petioles slender, 2.5--3.7 cm. long; petiolules 5--10 mm. long or obsolete; leaflets distinctly short-petiolulate or sessile, moderately firm, dark-green above (when mature) and paler beneath, oblong-lanceolate or lanceolate-elliptic to oblong, 2.5--8 cm. long, apically acute or acuminate, marginally entire, basally obtuse or attenuate into the petiolule, glabrous above when mature and pubescent or puberulent throughout beneath, glandular-resinous-punctate beneath; cymes very numerous, dense and congested, axillary, short-pedunculate, appearing with the new leaves; pedicels very short, densely pubescent; bracts lanceolate, yellow-subvelutinous; calyx campanulate, 2 mm. long, densely yellow-pubescent or -subvelutinous, its rim minutely 5-toothed, the teeth short and basally very broad, apically acute; corolla small, mauve, very pubescent, its tube twice as long as the calyx, 4 mm. long, the throat barbate; stamens and style exserted; fruits globose, 2.5--3 cm. wide, externally glabrous.

Gürke (1895) says of this species: "Dieser Str[auch] ist durch die sehr grossen, kugeligen Fr[ucht] auffallend; die Unterlippe ist dunkel-veilchenblau mit gelbem Haarpolster am Eingang des Schlundes, die 4 Lappen der Oberlippe sind schmutzig-gelblichweiss, die Staubbeutel blau." He cites *Volckens* 92 from "Buschgehölz". Dale & Greenway (1961) cite, from coastal savannas and scrub in Kenya, Dale 2776, Gardner 1465, Jeffery 152, Swynnerton 41 & 105, Trump 99, and Wakefield s.n. Chiovenda (1916) records the species from what was then Italian Somaliland.

Vernacular names listed for this plant are "mfududu", "mgegi", "mkaligote", and "mufudumaji".

*VITEX TELORAVINA* J. G. Baker

Additional bibliography: Mold., Phytologia 17: 42. 1968; Mold., Fifth Summ. 1: 263 (1971) and 2: 728, 788, & 930. 1971; Mold., Phytol. Mem. 2: 252 & 594. 1980.

Bernardi refers to this plant as a tree, 3--8 m. tall, and encountered it in open places in woods on denuded granitic mountains, at 1000--1200 m. altitude, in flower in November.

Additional citations: MADAGASCAR: Bernardi 11172 (N).

*VITEX THOMASI* DeWild.

Additional bibliography: Mold., Phytologia 17: 43. 1968; Mold.,

Fifth Summ. 1: 232 (1971) and 2: 930. 1971; Mold., Phytol. Mem. 2: 222 & 594. 1980.

*VITEX THOMASI* f. *KASAIENSIS* DeWild.

Additional bibliography: Mold., Phytologia 17: 43. 1968; Mold., Fifth Summ. 1: 232 (1971) and 2: 9-0. 1971; Mold., Phytol. Mem. 2: 222 & 594. 1980.

*VITEX THONNERI* DeWild.

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 40 (2): 336 (1915) and 57 (2): 402. 1938; Mold., Phytologia 17: 43. 1968; Mold., Fifth Summ. 1: 225, 227, & 232 (1971) and 2: 728 & 930. 1971; Mold., Phytologia 44: 408. 1979; Mold., Phytol. Mem. 2: 215, 218, 222, & 594. 1980.

The *G. P. Cooper* 355, distributed as *V. thonneri*, actually is *V. congolensis* DeWild. & Th. Dur.

*VITEX THONNERI* var. *TIBATENSIS* (Engl.) Pieper

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 57 (2): 402. 1938; Mold., Phytologia 17: 43. 1968; Mold., Fifth Summ. 1: 225 (1971) and 2: 728 & 930. 1971; Mold., Phytol. Mem. 2: 215 & 594. 1980.

*VITEX THORELII* Dop

Additional & emended bibliography: Dop, Bull. Soc. Hist. Nat. Toulouse 57: 206--207, 210, & 211. 1928; Fedde & Schust., Justs Bot. Jahresber. 56 (2): 286. 1937; Mold., Phytologia 17: 43. 1968; Mold., Fifth Summ. 1: 303 (1971) and 2: 930. 1971; Mold., Phytol. Mem. 2: 289 & 594. 1980.

*VITEX THYRSIFLORA* J. G. Baker

Additional synonymy: *Vitex thyrsofolius* J. G. Baker ex Bouquet, Invent. Pl. Méd. Tox. Cong. Braz. 33. 1967.

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 315 & 319. 1900; Hutchins. & Dalz., Fl. W. Trop. Afr., ed. 1, 2: 276. 1931; Kräusel, Justs Bot. Jahresber. 50 (1): 609. 1932; Wangerin, Justs Bot. Jahresber. 52 (1): 373. 1933; Fedde, Justs Bot. Jahresber. 52 (1): 826. 1934; Hutchins. & Dalz., Fl. W. Trop. Afr., ed. 2, 2: 276. 1936; Fedde & Schust., Justs Bot. Jahresber. 57 (2): 402. 1938; Roberty, Pét. Fl. Ouest-Afr. 178. 1954; Grout de Beaufort & Schnell, Mém. Inst. Fond. Afr. Noire 75: 8, 9, & 44--48, pl. 10 A & B. 1966; Schnell, Mém. Soc. Bot. France 113: 129 & 130, fig. 61. 1966; Schnell & Grout de Beaufort, Contrib. Etud. Pl. Myrmecod. 44--47, pl. 10, fig. A & B. 1966; Bouquet, Invent. Pl. Méd. Tox. Cong. Braz. 33. 1967; Mold., Phytologia 17: 33 & 43--44. 1968; Mold., Résumé Suppl. 17: 4. 1968; Schnell, Revist. Fac. Farm. Univ. Andes 7: 130--131, fig. 4A. 1970; Mold., Fifth Summ. 1: 217--221, 223, 225, 232, 233, & 253 (1971) and 2: 712, 723, 724, 728, & 930. 1971; Lewalle, Bull. Jard. Bot. Nat. Belg. 42 [Trav. Univ. Off. Bujumb. Fac. Sci. C.20]: [231]. 1972; Mukherjee & Chanda, Trans. Bose Res. Inst. 41: 40.

1978; Mold., Phytol. Mem. 2: 212, 213, 215, 217, 222, 223, 242, 460, & 594. 1980.

Additional illustrations: Grout de Beaufort & Schnell, Mém. Inst. Fond. Afr. Noire 75: 47, pl. 10, fig. A & B. 1966; Schnell, Mém. Soc. Bot. France 113: 129, fig. 61. 1966; Schnell & Grout de Beaufort, Contrib. Etud. Pl. Myrmecod. 44--47, pl. 10, fig. A & B. 1966; Schnell, Revist. Fac. Farm. Univ. Andes 7: 130, fig. 4A. 1970.

Schnell & Grout de Beaufort (1966) regard *V. agraria* Chev., *V. obanensis* Wernh., and *V. staudtii* Gürke as synonyms of *V. thyrsoiflora*, but add also *V. myrmecophila* Mildbr. which I regard as *V. thyrsoiflora* var. *laxiflora* Pieper. They cite Lebrun 2911 from Congo [Zaire] and LeTestu 4721 from Ubangi [Central African Republic] as typical of *V. thyrsoiflora* and Letouzey 3882 from the Cameroons and Tisserant 1159 from Ubangi as "*V. cf. thyrsoiflora*". Their conclusions regarding myrmecophily in this genus are worth repeating here: "Les espèces étudiées nous montrent des caractères myrmécophiles réalisés avec une fréquence remarquable. Suivant les cas, les rameaux sont non colonisés (sans pores), ou colonisés, avec des pores, à localisation précise. Le lien avec les fourmis du genre *Viticola* paraît étroit. Wheeler admet que *Viticola tessmanni* est un hôte obligatoire de *Vitex staudtii*."

"La disposition paire et opposée des orifices, et leur rotation de 90° d'un noeud à l'autre sont des caractères remarquables. Une étude anatomique permettrait de préciser la structure histologique des emplacements prédestinés, auxquels les fourmis percent les orifices; les observations anatomiques de Bailey (1921-1922) ont mis en évidence que l'épaisseur de l'anneau ligneux est plus grande sur les faces du rameau correspondant aux feuilles que sur les faces intermédiaires, -- sur lesquelles sont percés les pores. En raison de la disposition décussée des feuilles, cette structure se trouve décalée de 90° d'un entrenoeud au suivant; ainsi la disposition des pores, liée à l'épaisseur de l'anneau ligneux, se trouve commandée en définitive par la phyllotaxie des rameaux; il serait également fort intéressant de pouvoir déterminer par quel processus (mécanique ou peut-être même chimique) les fourmis détectent ces emplacements de moindre résistance, dans lesquels elles foreront les pores."

"L'existence de pores non nodaux, et même franchement internodaux, montre cependant la possibilité d'une certaine labilité du déterminisme de la localisation. La présence assez fréquente de cicatrices subéreuses non percées, disposées en ligne sur les entrenoeuds, plaide dans le même sens. On notera toutefois que c'est essentiellement sur les noeuds que se trouvent les pores bien individualisés, alors que les attaques partielles sont presque toujours internodales. Par ailleurs, lorsqu'il existe des pores non nodaux, ceux-ci de même que les cicatrices dues à des attaques peu accentuées, se trouvent sur les faces de l'entrenoeud ne portant pas les feuilles, -- illustrant le caractère prédéterminé de cette localisation des pores en relation avec les insertions foliaires."

Recent collectors have encountered *Vitex thyrsoiflora* along gravelly roadsides and in gallery forests, at 1000--1200 m. altitude, describing it as a tree, 19 feet tall, and have found in it full flower in May. The corollas are said to have been "white" on Konnoh 175.

Additional citations: LIBERIA: Jacques-Georges 27676 (Mu); Konnoh 175 (W--2126712). BURUNDI: Lewalle 3515 (Ld). MOUNTED ILLUSTRATIONS: Schnell & Grout de Beaufort, Contrib. Etud. Pl. Myrmec. pl. 10. 1966 (Ld).

#### *VITEX THYRSIFLORA* var. *LAXIFLORA* Pieper

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 57 (2): 402. 1938; Grout de Beaufort & Schnell, Mém. Inst. Fond. Afr. Noire 78: 45, pl. 10, fig. C. 1966; Schnell & Grout de Beaufort, Contrib. Etud. Pl. Myrmec. 45, pl. 10, fig. C. 1966; Mold., Phytologia 17: 44. 1968; Mold., Fifth Summ. 1: 225 (1971) and 2: 712, 723, & 930. 1971; Mold., Phytol. Mem. 2: 215 & 594. 1980.

Illustrations: Grout de Beaufort & Schnell, Mém. Inst. Fond. Afr. Noire 75: 45, pl. 10, fig. C. 1966; Schnell & Grout de Beaufort, Contrib. Etud. Pl. Myrmec. 45, pl. 10, fig. C. 1966.

#### *VITEX TOMENTULOSA* Mold.

Additional & emended bibliography: Fedde & Schust., Justs Bot. Jahresber. 60 (2): 576. 1941; Alain in León & Alain, Fl. Cuba, imp. 1, 4: 317 & 318. 1957; Mold., Phytologia 17: 44. 1968; Mold., Fifth Summ. 1: 98 (1971) and 2: 930. 1971; Alain in León & Alain, Fl. Cuba, imp. 2, 2: 317 & 318. 1974; Mold., Phytol. Mem. 2: 91 & 594. 1980.

Recent collectors have encountered this plant in woods and coastal thickets and limestone cliffs.

Additional citations: CUBA: Oriente: León 16336 (W--2289548); Sagra 809 (P), 909 (P). Pinar del Rio: Acuña & Zayas 19936 (N), 19938 (N).

#### *VITEX TRICHANTHERA* J. G. Baker

Additional bibliography: Mold., Phytologia 17: 44. 1968; Mold., Fifth Summ. 1: 263 & 426 (1971) and 2: 617 & 930. 1971; Mold., Phytol. Mem. 2: 252 & 594. 1980.

#### *VITEX TRIFLORA* Vahl

Additional & emended synonymy: *Vitex triflorus* Vahl ex Cain, Man. Veg. Anal., imp. 1, 278 & 279. 1959. *Vitex trifila* Vahl ex López-Palacios, Fl. Venez. Verb. 627, in syn. 1977. *Vitex triflora* var. *trifoliata* López-Palacios, Fl. Venez. Verb. 654, in syn. 1977. *Vitex triflora* Mold., Phytol. Mem. 2: 460, in syn. 1980.

Additional bibliography: Sweet, Hort. Brit., ed. 1, 1: 323. 1826; Loud., Hort. Brit., ed. 1, 246. 1830; Sweet, Hort. Brit., ed. 2, 416. 1830; Loud., Hort. Brit., ed. 2, 246. 1832; G. Don in Loud., Hort. Brit., ed. 3, 246. 1839; Sweet, Hort. Brit., ed. 3, 550. 1839; D. Dietr., Syn. Pl. 3: 610 & 611. 1843; Voigt, Hort. Suburb. Calc. 473. 1845; Walp., Repert. Bot. Syst. 4: 81--82, 86,

91, & 92. 1845; Schau. in A. DC., Prodr. 11: 693--694. 1847; Buek, Gen. Spec. Syn. Candol. 3: 86 & 502. 1858; F. Muell. in Walp., Ann. Bot. Syst. 5: 712. 1860; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1154. 1876; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 172. 1895; Peckolt, Bericht. Deutsch. Pharm. Gesel. 14: 482. 1904; H. N. & A. L. Mold., Pl. Life 2: 67. 1948; Murça Pires, Donzhansky, & Black, Bot. Gaz. 114: 473. 1953; R. C. Foster, Contrib. Gray Herb. 184: 171. 1958; Cain, Man. Veg. Anal., imp. 1, 67, 278, & 279, fig. 45. 1959; Macbr., Field Mus. Publ. Bot. 13 (5): 692 & 697. 1960; Glerum & Smit, Invent. Florest. Amaz. 9: 35 & 112. 1965; Mold., Phytologia 17: 11--13, 45--47, 50, 54, & 56. 1968; Mold., Résumé Suppl. 16: 25 & 29. 1968; Cain, Man. Veg. Anal., imp. 2, 67, 278, & 279, fig. 45. 1971; Mold., Fifth Summ. 1: 128, 131, 133, 134, 137, 144, 180, 184, 375, 420, 423, & 466 (1971) and 2: 570, 614, 615, 713, 717, 725, 727, 729, 730, 766, 769, 770, 787, & 930. 1971; Anon., Biol. Abstr. 54 (7): B.A.S.I.C. S.282. 1972; Mold., Phytologia 23: 315--316 & 418 (1972) and 25: 168, 244, & 245. 1973; Hocking, Excerpt. Bot. A.23: 291. 1974; López-Palacios, Revist. Fac. Farm. Univ. Andes 15: 102, fig. [21]. 1975; Soukup, Biota 11: 20. 1976; López-Palacios, Fl. Venez. Verb. 289, 582, 610, 627--630, 647, 651, 653, & 654, fig. 146. 1977; Mold., Phytologia 36: 35, 36, & 48. 1977; López-Palacios, Revist. Fac. Farm Univ. Andes 20: 34. 1979; Mold., Phytologia 44: 384. 1979; Mold., Phytol. Mem. 2: 121, 124--126, 136, 172, 176, 367, 460, & 594. 1980; Mold., Phytologia 50: 245, 248, 266, & 267. 1982.

Additional & emended illustrations: Huber, Bol. Mus. Para. Goeldi 5: pl. 1, fig. 5--8. 1909; Cain, Man. Veg. Anal., imp. 1, 278, fig. 45 (1959) and imp. 2, 278, fig. 45. 1971; López-Palacios, Revist. Fac. Farm. Univ. Andes 15: fig. 21. 1975; López-Palacios, Fl. Venez. Verb. [628], fig. 146. 1977.

Recent collectors describe this plant as a shrub, 2--5 m. tall, treelet, or small tree, 3--20 m. tall; trunk to 70 cm. in diameter at breast height; bark with longitudinal furrows; wood white or light-yellow; leaves bright dark-green or brilliant pale-green, the venation prominent beneath; bracts brilliant yellow-green; buds brown; peduncles white; flower-buds white; flowers fragrant; calyx green, blue or whitish; anthers darker; fruiting-calyx enlarged, green; fruit green to light-yellow when young, brown to black when mature.

Cain (1959) states that the blade areas of the leaves average 67.4 percent of the length-breadth rectangles, showing by the application of the 'rule of thumb' that the blade area of the leaves is approximately 2/3 of the length-breadth rectangular area.

Collectors have encountered this plant in forests and disturbed primate forests (mata) on terra firme (non-inundated soil), in high, tall, seasonally very dry, and riverine forests, on forested slopes and granite peaks, in sandy soil of mata, on rocky outcrops on summits, on riverbanks, and on plateaus covered by ferrobaukite, at 118--800 m. altitude, in anthesis from May to November, and in fruit in January and from September to November.

The corollas are said to have been "rosy" on Cid & al. 647 and Cordeiro 735, "rosy-white" on Cid & al. 78, "blue" on Croat 20610, Mennaga 497, Prance & al. 6031 & 7093, Silva 1148, and Silva & Sousa 2393 & 2476, "light-blue" on Prance & al. 6060, "violet" on Granville B.4623, "brilliant-violet" on Schunke 8267, "light-violet (10 PB 6/3 or 10 PB 7/6)" on Schunke 843, 6569, & 6668, "violet with brown stripes in the throat" on Prance & al. 14344, "lilac" on Ribeiro 1413, "pale-blue, lip darker blue" on Maas & al. 2220, "pale-purple, 2 lobes ('limbs') white" on Irwin & al. 55130, "white with brown hairs inside" on Hallé 1029, "tube and throat dirty-white, limb purple-blue (10 PB 5/10), tube inside with dark-blue (10 PB 2/6) lines" on Lindeman & al. 547, and "tube light-purple outside, white with purple lines inside, lower petal blue, base with yellow pubescence, other petals white" on Bisby & al. P.18091.

Granville describes this species as follows: "Arbre 12 m. de haut environ; tronc cylindrique sans contreforts; bois brun jaune clair, dur; rhytidome mince, gris clair, mat; rameaux noirs à lenticelles blanchâtre allongées; feuilles opposées, trifoliolées; inflorescences en cymes axillaires de 3 fleurs parfumées; calice zygomorphe, vert, à tube de 7 mm. et 5 dents étalées groupées en 2 lèvres (une a 2 dents, une a 3 dents) de 1 cm. de long; corolle zygomorphe à tube de 28 mm. de long, blanchâtre à l'extérieur, blanc strié de violet à l'intérieur, légèrement arqué, 5 dents étalées dont 4 oblongues, de 7 x 3 mm., blanc lilacé, les 2 dents supérieures soudées sur le tiers de leur longueur, la cinquième dent est étalée en forme de labelle, violet clair, suborbiculaire, de 12 mm. de Ø, dentelée sur les bords; étamines 4 libres exsertes, dont 2 de 22 mm. et 2 de 23 mm., anthères violettes; ovaire supère vert obové, de 4 mm. de long à style unique, filiforme, blanc, de 10 mm.; stigmate violet clair, discrètement bilobé." Oldeman, however, says "corolle jaune ambré, style crème, étamine brun chocolat."

Loudon (1832) and Sweet (1826) both assert that *Vitex triflora* was introduced into cultivation in England from French Guiana in 1823.

Additional vernacular names reported for this species include "coramiñón", "guarataro", "sacha tãhuarí", "tahuari", "taraman", "taruma", "three-flowered chaste-tree", and "yanomano".

Lopez-Palacios (1979) predicts that this species will eventually be found in Amazonian Colombia. Peckolt (1904) reports that "Die pflaumengrossen, weissbefilzten, saftigen, wohlgeschmeckenden Steinbeeren sind ein beliebtes Waldobst."

Granville B.4171, collected on October 19, 1971, bears a statement on its accompanying label that it represents the first known collection of this species in French Guiana, but as early as in my 1958 work I have cited no less than 20 earlier collections (54 herbarium sheets) from this country!

Denslow 2414 is sterile, but judging by the material available seems to represent this taxon. Krukoff 5765 is a mixture of *Vitex triflora* and its form *quinquefoliolata* (Mold.) Mold.

Macbride (1960) cites Ducke 7561, Klug 1254, 1492, & 2791, and

Williams 4195 from Peru. López-Palacios (1977) cites Aristeguieta & Lizot 7372 and Williams 15688 from Amazonas, Venezuela.

Material of *Vitex triflora* has been misidentified and distributed in some herbaria as *V. klugii* Mold. and *V. stahelii* Mold., Acanthaceae, Bignoniaceae, Boraginaceae, and Rubiaceae. On the other hand, the Gentry, Ayala, & Revilla 15638, distributed as typical *V. triflora*, actually is its var. *coriacea* Huber, while Albuquerque Lobo, Vilhena, & Ribeiro 19 is var. *kraatzii* Huber.

Additional citations: COLOMBIA: Antioquia: J. Denslow 2414 (Ws). VENEZUELA: Amazonas: Aristeguieta & Lizot 7362 (Ld, N, W--2882623); Steyermark, Davidse, & Guanchez 122148 (Ld); Ll. Williams 15688 (N). SURINAM: Irwin, Prance, Soderstrom, & Holmgren 55130 (N, W--2736812); Lindeman, Stoffers, Gbrts-van Rijn, & Jansen-Jacobs 547 (N); B. Maguire 24837 (Se--182921); Mennaga 497 (N); Mori & Bolten 8568 (Ld, N). FRENCH GUIANA: Cremers 7078 (Ld); Granville 3629 (Ld), B.4171 (N, N), 4569 (N, N), 4623 (N); Halle 1029 (P); Maas, Maas, Mennaga, & Koek-Noorman 2220 (N); Lindeman B.752 (N), B.2326 (Cy, Cy); Prévost 330 (E, Ld). PERU: Huánuco: Schunke Vigo 843 (N, W--2863126), 5897 (W--2699136), 6569 (W--2653840). Loreto: Croat 20610 (Lc, Ld, N); R. Ramirez 7 (Ld). San Martín: Schunke Vigo 6668 (W--2788266), 8267 (N). BRAZIL: Acre: Krukoff 5765 in part (Mu); Lowrie, Lowry, & Souza 248 (Ld); Prance, Coêlho, Ramos, & Farias 7786 (Ac, N). Amapo: Murça Pires & Cavalcante 52602 (S). Amazonas: Bisby, Steward, & Ramos P.18091 (N); Cid, Buck, Nelson, Almeida, Mota, & Lima 78 (Ld), 647 (Ld); Krukoff 4704 (Mu); Monteiro, Pinheiro, & Ramos 14268 (N); Prance, Hill, Coêlho, & Ramos 24306 (N); Prance, Maas, Atchley, Steward, Woolcott, Coêlho, Monteiro, Pinheiro, & Ramos 14268 (Ac, N), 14344 (N); N. T. Silva 1148 (Ld, N). Pará: Cid, Ramos, Mota, & Rosas 2379 [Herb. Inst. Nac. Pesq. Amaz. 96728] (Ld, N); Murça Pires 9934 (N); N. T. Silva 1148 (N); Ribeiro 1413 [Herb. IPEAN. 162968] (Ld); Rosa 253 [Herb. IPEAN. 145967] (Ld); Silva & Rosário 3672 (N); Silva & Souza 2393 (Ac, N), 2476 (Ld, N), 2575 (Ac, N). Rondônia: Cordeiro 735 [Herb. IPEAN. 150399] (Ld); Forero & Wrigley 7093 (Ld, N); Prance, Forero, Wrigley, Ramos, & Farias 6005 (Ac, N), 6031 (N). BOLIVIA: Pando: Prance, Forero, Wrigley, Ramos, & Farias 6060 (Ld, N, W--2829507). MOUNTED ILLUSTRATIONS: Mart., Fl. Bras. 9: pl. 49. 1851 (Ld, N); Huber, Bol. Mus. Para. Goeldi 5: pl. 1, fig. 5--8. 1909 (W).

#### VITEX TRIFLORA var. ANGUSTILOBA Huber

Additional bibliography: Mold., Phytologia 17: 46. 1968; Mold., Fifth Summ. 1: 180 (1971) and 2: 729 & 930. 1971; Mold., Phytol. Mem. 2: 172 & 594. 1980; Mold., Phytologia 50: 248. 1982.

Recent collectors describe this plant as a tree, 2--10 m. tall, the trunk 10 cm. in diameter at breast height, and the fruit green when immature. They have found it growing on *terra firme*, in flower in September and October and in fruit in October. The corollas are said to have been "rose" in color on Austin & al. 7228 and "corolla-tube light-purple outside, white with purple lines inside, the lower petal blue, the base with yellow pubescence, the other petals white" on Bisby & al. P.18091.

The *Prance & al. 12523*, distributed as *V. triflora* var. *angustiloba*, actually is something rubiaceous, probably a species of *Psychotria*.

Additional citations: BRAZIL: Amapá: *Austin, Nauman, Secco, Rosário, & Santos 7228* (Ld, N). Amazônia: *Bisby, Steward, & Ramos P.18091* (W--2898197). Pará: *Murça Pires & Belém 12523* (Ld)

*VITEX TRIFLORA* var. *CORIACEA* Huber

Additional bibliography: Mold., *Phytologia* 17: 46. 1968; Mold., *Fifth Summ.* 1: 180 (1971) and 2: 729 & 930. 1971; Mold., *Phytol. Mem.* 2: 136, 172, & 594. 1980.

Recent collectors describe this plant as a tree, 5--10 m. tall, with "brown" fruit, and have found it growing in mostly cleared areas among remnant vegetation and in high woods on terra firme, in full anthesis in January and November, and in fruit in January. The corollas are said to have been "blue" on *Gentry & al. 15638* and "lilac" on *Oliveira 3641*. The vernacular name, "tarumã", has been reported for it and material has been distributed in some herbaria as typical *V. triflora* Vahl.

Additional citations: PERU: Loreto: *Gentry, Ayala, & Revilla 15638* (N). BRAZIL: Amapá: *E. Oliveira 3641* (N). Pará: *E. Oliveira 3865* (N). MOUNTED ILLUSTRATIONS: Huber, *Bol. Mus. Para. Goeldi* 5: pl. 1, fig. 1--4. 1909 (W)

*VITEX TRIFLORA* var. *FLORIBUNDA* Huber

Additional bibliography: Mold., *Phytologia* 17: 46--47. 1968; Mold., *Fifth Summ.* 1: 180 (1971) and 2: 725, 729, & 930. 1971; Mold., *Phytologia* 36: 35. 1977; Mold., *Phytol. Mem.* 2: 172 & 594. 1980.

Recent collectors describe this plant as a tree, 6--10 m. tall, the trunk to 8 cm. in diameter at breast height and 1 m. in circumference, the calyx green, the stamens white or rose, and the anthers cream-color. The corollas are said to have been "rose" on *Cordeiro 536* and *Murça Pires & Belém 12342*. It has been found in anthesis in August.

The *Prance & al. 12297*, distributed as *Vitex triflora* var. *floribunda*, actually is not verbenaceous.

Additional citations: BRAZIL: Pará: *Murça Pires & Belém 12297* (Ld), *12342* (Ld). Rondônia: *Cordeiro 536* [Herb. IPEAN. 150200] (Ld). MOUNTED ILLUSTRATIONS: Huber, *Bol. Mus. Para. Goeldi* 5: pl. 2, fig. 9--11 & 3, fig. 21. 1909 (W).

*VITEX TRIFLORA* var. *HIRSUTA* Mold., *Phytologia* 23: 315--316. 1972.

Bibliography: Anon., *Biol. Abstr.* 54 (7): B.A.S.I.C. S.282. 1972; Mold., *Phytologia* 23: 315--316 & 418. 1972; Hocking, *Excerpt. Bot. A.* 23: 291. 1974; Soukup, *Biota* 11: 20. 1976; Mold., *Phytol. Mem.* 2: 136, 172, & 595. 1980.

Schunke describes this plant as a tree, 4--5 m. tall, the leaves brilliant pale-green, fragrant, the calyx pale-green, and the immature fruit greenish-yellow and pubescent. He found it growing in a high forest at 295 m. altitude, in fruit in October.

[to be continued]